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HEALTH EDUCATION IN RURAL SCHOOLS*

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The country usually thought to be more healthful than the city. One of the earliest memories of my boyhood was a feeling of pity for those who were compelled to live in the city; for chance glimpses of the metropolitan districts showed that many of the inhabitants lived in crowded tenements and were denied even a plot of green grass. And among the middle classes, who owned houses and lots worth several times more than my father's farm, the space was so limited that I wondered how they managed to live. In a high school debate on the question: *Resolved, that the country is a more desirable place to live in than the city,* I remember that the side in favor of the country based practically all of its arguments on the proposition that the country is much more conducive to health than the city. But as nearly as I can remember this proposition was not based on any statistical information, but rather on mere beliefs.

The natural opportunities for health in the country. The belief in the superior healthfulness of the country over the city is due in all probability to the natural advantages possessed by the country. The city being inferior to the country in these respects, the conclusion is that people in the country are healthier than in the city. For example, the inhabitants of the rural districts instead of living in congested localities are scattered over wide areas. Often the houses of farmers are miles apart, and, even in the most thickly settled portions of our agricultural sections, the houses as compared with city homes are quite isolated. In the country there is an abundance of fresh air, sunshine and nourishing foods. The farmer may raise his own fruits, grains and vegetables and produce his own eggs and milk. This personal care ought to insure food of quality and cleanliness. There is little possibility of food being contaminated as it might be if it passed through many hands. People in the country while doing their daily work get plenty of vigorous exercise in the open air. Then, too, the country because of its quiet serenity and beauty lends itself spontaneously to peace and sanity of mind. While the city dweller lives among strenuous confusion and exacting industrial conditions, the farmer leads an independent life in surroundings conducive to health of mind and body. Consequently the people in the country must be healthier than those in the city. Such are the ordinary conclusions. What are the facts? Fortunately a number of investigations have now been made which enable us to establish conclusions on authentic information.

*A chapter from a forthcoming volume.

CITY SURPASSES COUNTRY IN HEALTHFULNESS

The study of statistics shows that the common notion of the supreme healthfulness of the country is not based on reliable information. A quarter of a century ago this belief would have been justified; but within the last decade or so the city has made wonderful strides in hygiene and sanitation. The country has lagged behind and its death rate is practically the same that it was forty or fifty years ago. It is true that the death rate in the city of New York was greater than that in rural New York up to 1900, but after that date it fell below that of rural New York. Today it is safer to live in the largest city in the United States than in the country surrounding it. This is a brilliant achievement in the history of preventive medicine, for it was undoubtedly a result of careful health supervision in matters pertaining particularly to improved sources of the water, milk and general food supply, the proper disposal of sewerage and garbage and the application of the laws of hygiene. As Dr. Briggs, the State Commissioner of Health for the state of New York says, "the rural districts have failed to realize the great importance of improved sanitation," and "the rural death rate from general diseases, typhoid fever, malaria, diarrhœa, and enteritis is greatly in excess of that in the urban districts." What is true of the state of New York is probably typical of the whole of the United States. There is a general concensus of opinion that the country has been touched but little by the great movement of health which has reached our large cities.

Let us consider some of the facts which throw light on the actual health conditions in rural communities.

DEFECTIVE HOUSING IN THE COUNTRY

The broad acres of the country and the long distance between dwellings are so striking that one is likely to overlook the character of the houses themselves. Dr. Bashore,* an inspector for the Pennsylvania Department of Health, conducted an investigation which was made for the most part in a typical farming community, inhabited by native-born Americans. His findings are somewhat surprising. He found the housing conditions bad. Much of this was due to defective building. It is unusual in the country to employ an architect. The builder is ordinarily a country carpenter whose first aim is to get the most building on the land for the least money. Sometimes the owner himself plays architect, and then the results very often may be worse. The question of health has little or no bearing on the character of the building to be constructed. As a result of such a state of affairs country houses often have grave sanitary defects. Frequently they are built on low ground, have inadequate window space, poor lighting and a questionable method of disposing of sewerage.

OVERCROWDING AND IGNORANCE OF HYGIENE

Even in the open country there is a good deal of overcrowding resulting not so much from bad buildings as from the ignorance of their inmates. In speaking of this Dr. Bashore says: "For example, a nurse

*See his volume on "Overcrowding and Defective Housing in the Rural Districts."

from one of the State Dispensaries, in her visiting work, came across a certain farmhouse where five people were accustomed to sleep in one not very large bedroom which had only one small window and even that was nailed shut; one of these five had incipient tuberculosis. These people were well-to-do farmers living in a large twelve-room stone house, and simply crowded into one room for the sake of economy—presumably to save coal and wood."

In his interesting study Bashore also refers to the overcrowding in certain mountain districts of Pennsylvania. "It has been noted in these places," he says, "that the natives do not have the strong, healthy build, and a color redolent of health, but the thin, pale, and wan features of those suffering from the lack of pure air. Yet these people live in the purest of God's fresh air, in places akin to those in which we build our Sanatoria. Why is it? In many instances the explanation seems to be dependent on the personal habits of these mountaineers, who, on the advent of winter, 'hole up,' a good deal like certain animals. They lay in a supply of wood, but as wood is becoming scarce and they are generally lazy and shiftless, the supply is not over-abundant, so they economize space and heat, and have fire only in the cook-stove in the kitchen. Windows and unnecessary doors are nailed shut, and here around the stove the family spend most of the winter, eat and sleep in one, or at the most two, rooms; and the result? The faces you see here in these mountain homes remind you of the faces you see in the densely crowded, insanitary tenements of the cities. The complete outdoor life of summer is barely able to combat the bad air and lack of air during the winter months, and a chronic condition of lowered vitality results."

To the possible objection that Dr. Bashore's investigations reveal conditions that are not typical of rural districts, let us consider some of the more extensive inquiries and surveys.

*A rural sanitary survey of four Indiana counties.** During the summer and fall of 1915 the State Board of Health of Indiana conducted a survey of four counties in Indiana. No incorporated towns and cities were inspected because the survey was entirely rural. The rural population of these four counties according to the U. S. census method was 24,650, or 69.5% of the total population. The inspectors employed visited every farm house in the counties named, made a careful survey of each and reported their findings.

A simple score card based on ten points, each to have ten for its highest figure, was adopted. 100 was to stand for a house that was perfect in its hygiene and sanitation, and the total of the scores allowed by the investigator would be the percentage standing. A margin of 25% was to be allowed for the standard, and all homes which scored under 75% were to be considered insanitary.

These were the points scored: (1) site; (2) sanitary conditions; (3) house; (4) cellar; (5) ventilation; (6) water supply; (7) sewerage disposal; (8) barn, barnyard, pig-pen, coops; (9) disposal of manure: (10) health; remarks.

The detailed method for scoring these different points will not be considered here, but let us notice some of the general conclusions of these investigators. The average scores for these four counties were 53%, 54%, 43% and 52% respectively. Ohio County, the county having the

*From unpublished data.

highest average score, had these individual scores on the ten points considered: (1) site, 73%; (2) sanitary condition of premises, 68%; (3) house, 68%; (4) cellar, 31%; (5) ventilation, 14%; (6) water supply, 15%; (7) sewerage disposal, 32%; (8) barnyard, 55%; (9) disposal of manure, 22%; and (10) health, 29%.

In their general survey of Ohio County, the surveyors say: "A review of the points considered shows that 86% of the farm houses surveyed in Ohio County are insanitary, that the death rate is higher than the state rate by 0.2 in 1,000; that the consumption rate is higher than the state by 25.5, and the typhoid rate is higher by 0.3 in the 100,000."

These figures speak for themselves. They show most deplorable conditions in the country, and the probability is that these conditions are fairly typical of what might be expected in any ordinary rural district in the United States. In fact, it is safe to assume that these counties are far superior in hygiene and sanitation to many counties in the southern part of the United States.

*A health survey of White County in Illinois.** This survey was carried out during 1915 by Dr. I. A. Foster, medical inspector of the Illinois State Board of Health, and Miss Harriet Fulmer, extension secretary of the Illinois Association for the Prevention of Tuberculosis. White County is in far southern Illinois, and is one of the leading farming districts of the section known as "Egypt." There is nothing extraordinary or peculiar about the county. The inhabitants are Americans living largely in rural communities, the largest town having less than 3,000 population. "Of the 23,000 people in the county, about 10,000 live in the towns and villages, over 13,000 being scattered through a rather thickly settled, rich farming country, which has a fair proportion of wooded land and tilled farms, well drained and having the general natural resources for the promotion of health and the development of able-bodied men and women."

The findings in this survey were quite similar to those revealed in the survey of the four Indiana counties to which we have referred. In a region having some wealth and a minimum of poverty, the natural assumption would be that the majority of the people would be well housed, well fed and living under moderately hygienic conditions. The investigation shows that darkness and poor ventilation prevailed in the several hundred homes inspected, not because of lack of windows, but because the windows were tightly closed and the shades were drawn to keep out the sunlight. "There is a positive dislike for fresh air among most of the people of this section." There was also much sleeping-room congestion, and, strange to say, this was more serious in the rural sections than in the towns. Filthy and insanitary privies prevailed. The tuberculosis problem was unusually grave.

It is significant that many of the bad health conditions in this county were due not to poverty or to naturally unhealthful surroundings, but to ignorance of the simplest laws of hygiene and sanitation. The following comments taken from the report of the survey are of unusual interest:

"It was found during investigation that the dietary of fully 75 per cent. of the people of White County was lacking in milk, meat, butter, eggs, homemade bread and vegetables. While no one was found to be

*"A Health Survey of White County, Illinois," Illinois Health News, February, 1916.

actually hungry, there were large numbers of undernourished and anæmic people.

"This seemed due in some instances to lack of intelligence; in some instances to lack of physical ability on the part of the head of the family to prepare proper dishes, and in other cases the fault lies with the customs of the people. Poverty and inability to secure food is a factor in only a small percentage of cases.

"The water supply as a rule is only fair. In most instances—as must be true where privy vaults and surface water supply are employed together—it is a real and serious source of danger. There are few wells. The water usually comes from cisterns which are not properly lined. In two of the larger towns the municipal water supply comes from a river. Not over 25 per cent. of the people in these towns take the precaution of boiling the water. Throughout the entire community there is doubtless general soil pollution."

(NOTE: In next month's article Dr. Andress will discuss the sanitation of rural school buildings and grounds.—Ed.)

THE PRESENT STATUS OF SCHOOL HEALTH WORK IN THE 100 LARGEST CITIES OF THE UNITED STATES

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The returns tabulated in this study are based upon a questionnaire which was sent out, under date of November 1st, 1916, to the superintendent of schools of every city in the United States having upwards of 50,000 population. According to the latest available census enumerations there are 121 such cities. Answers were received from exactly 100 of these. The questions asked were as follows:—

I. What is the school enrollment of your city?

II. How many school physicians? What is their approximate compensation?

III. Are there any school nurses? How many? Their compensation?

IV. Are there school clinics, such for example as (1) psychological, (2) dental, (3) eye, (4) ear, etc? Are these free? Are they proving successful? How many children are benefited by them?

V. Are there other movements or agencies in your city for the safeguarding of the health of the pupils in the public schools?

The cities to which the questionnaire was sent were divided into four groups, according to population, as follows:—

Group I including all cities of 500,000 population and over.
Group II including all cities of from 250,000 to 500,000 population.
Group III including all cities of from 100,000 to 250,000 population.
Group IV including all cities of from 50,000 to 100,000 population.

According to this classification, the cities and their total enrollment line up thus:—

Group I	8 cities*	1,186,940	pupils
Group II	15 cities	737,506	pupils
Group III	24 cities	514,037	pupils
Group IV	53 cities	530,476	pupils
Total	100 cities	2,968,959	pupils

*The returns from New York are not included in Group I. See article by Dr. C. Ward Crampton on the New York system of school hygiene, which appeared in our January number.

In the 100 cities studied, therefore, approximately 3 millions of school children, or more than one-eighth the total enrollment in the public schools of America, are registered. In last month's article we confined our tables and discussion to the status of the school physician in the 100 cities. This month we turn our attention to the school nurse and her place in the economy of educational hygiene.

THE SCHOOL NURSE.

Before glancing at the tables, let us for a moment review some of the factors in school health work that are leading toward the institution of the school nurse as a valuable and economic asset to the work of school medical inspection.

I. Perhaps the chief factor responsible for the introduction of the school nurse into the schoolroom has been the perennial inability of the inspecting physicians to secure corrective action on the part of the home with reference to any defects or infirmities discovered. Dr. Hayward,* an English school doctor, expresses this fact happily thus:

"As a doctor I felt quite stranded in the strange atmosphere of an elementary school, coming into contact not so much with actual illness as with the primary conditions which produce and foster it. Dirt, neglect, improper feeding, malnutrition, insufficient clothing, suppurating ears, defective sight, verminous conditions, the impossibility of getting adequate information from the children or a knowledge of their home conditions; and nobody to whom one could give directions or who could help in examining the children. The only means of approaching the parents was to send an official notice that such or such a condition required treatment. My duties began and ceased with endless notifications, and there it all stopped, as very little notice was taken of them."

The records kept by large cities in our own country, such for example as New York, Chicago, and Philadelphia, show that the addition of the

*Quoted by Hoag and Terman in "Health Work in the Schools," Boston, Houghton, Mifflin Company, 1914. Chapter IV.

school nurse has increased the tendency on the part of the home to follow the advice of the examiners by many hundred percent. Thus, the office of the school nurse lies not only in a careful oversight of the general conditions of health among the school children, but includes a sort of "follow-up" work which takes her into a great number of the homes represented in the schools of her district. It is a matter of indifference to her whether a given child is anæmic, or whether his eyesight is deficient, or yet whether he has impetigo or scabies,—once his defect has been noted by the physician or herself, it becomes her duty to see to it that the home is sufficiently impressed to act, or, if such impression be impossible, to provide the needed corrective treatment through clinics or other local philanthropic agencies. In the city of Chicago, for example, during the year 1915, the nurses in the Division of Child Hygiene of the Department of Health made a total of 78,221 calls at the homes of deficient children with a view toward giving instruction concerning the care or treatment of the defects found. During the same period, the Chicago staff of nurses were responsible for 13,214 minor operations for tonsils, adenoids, etc., and were instrumental in securing treatment at dispensaries, or by private physicians, by dentists, opticians, or through charities, etc., of 21,706 cases. This single citation will suffice to illustrate the importance of the "follow-up" work of the school nurse in Chicago—work which the 124 school physicians in service during 1915 could never have accomplished. And Chicago is only typical, it appears, of all other cities in the matter of school nursing.

II. Most physicians are, by their training, skilled in making diagnosis and in detecting symptoms of contagious and infectious diseases, but their course in the medical school has not afforded them any extraordinary cleverness in discovering latent defects and abnormal tendencies in children. It has been said repeatedly that well-trained school nurses are more quick to discover symptoms of this nature than are the school physicians themselves. Whether this be true or not, the fact remains that a capable nurse is the only health officer ordinarily needed in the schoolroom. Indeed, many cities and towns, being unable to afford the employment of competent physicians for their schools, are supporting nurses only, and with highly satisfactory results. It should be borne in mind, however, that there are certain fields of disease and disorder that no nurse is competent to cover. Irregularities of the heart and lungs, nervous disorders, and certain other organic affections are realms which belong rightly to the medical expert. Since the ideal of school health work is not merely corrective but is likewise, and in a higher sense, preventive hygiene, it appears that the school physician will remain indispensable in the periodic examination and inspection of all pupils, in order that any tendencies to organic defect may be discovered and so checked.

III. The matter of the relative cost of employing physicians and nurses is an item of no small moment in favor of the latter as the more economical type of health officer. When one considers that the ordinary school physician receives an annual salary of $750 to possibly $1000, and devotes only two or three hours a day to school inspection, and then reflects that a nurse, devoting all her time to this work, may be secured for an expenditure no greater, the conclusion cannot remain in doubt. A competent nurse can probably accomplish from three to five times as

much as a physician, and do the work with approximately the same good results.

IV. The school nurse, from the very nature of her duties in the "follow-up" phase of health inspection, enters many of the homes and becomes thus instrumental in connecting vitally the work of the school and the home. Through her skill and tact she is not only able to create in the parents a new interest in the school, but to educate and influence the home in a great number of ways. Drs. Hoag and Terman, in the volume cited above, have outlined well something of the value of the school nurse as a social worker.

"...She instructs ignorant but fond mothers in the best methods of feeding, clothing and caring for their children. She is received in their homes as no other official visitor could possibly be. Mothers are quick to detect the genuineness of her interest in their children, and are often ready to follow with blind faith any instructions she has to offer. At her advent in a tenement or street, the mothers not infrequently crowd eagerly around her, plying her with questions and bringing their babies for inspection. The school nurse is thus a potent factor in diminishing infant mortality... In many a family she becomes a spiritual adviser, not only pointing out inadequate sanitation which keeps them sick, but also educating them on the folly of cut-throat chattel mortgages, unnecessary furniture purchased at ruinous prices on the installment plan, the short-sighted policy of taking children prematurely out of school to work, etc...."

With this statement of the recent tendency toward the school nurse as the efficient and economical solution of the health oversight problem in our schools, let us now come at once to the present status of the school nurse in the 100 cities.

Group I. Table No. 1.

Cities	School Enrollment	No. School Nurses	Approximate No. Children per Nurse	Salary of Nurses
Baltimore,	81,169	10	8,000	$600
Boston,	111,938	38	3,000	708—900
Chicago,	450,000	150	3,000	700—900
Cleveland,	98,279*	30	3,250	600—900
Detroit,	96,067	20	4,750	1000
Philadelphia,	193,380	38	5,000	630—750
Pittsburgh,	80,000	32	2,500	1250
St. Louis,	89,386	22	4,000	600—750

Three of the cities in Table No. 1 employ supervising or head nurses; Boston, one, at a salary of $1500; Chicago, five, at salaries ranging from $1000 to $1200; Philadelphia, one, at a salary increasing progressively from $800 the first year to $1000 the fifth. The last mentioned city has also one assistant head nurse whose salary is similar to that of the regular inspecting nurses.

*Includes H. S.

GROUP II. TABLE No. 2.

Cities	School Enrollment	No. School Nurses	Approximate No. Children per Nurse	Salary of Nurses
Buffalo,	69,000	..	.....	.....
Indianapolis,	43,000	8	5,500	$750
Jersey City,	42,534	14	3,000	720—780
Kansas City (Mo.),	46,000	0	.....	.....
Los Angeles,	90,000	10	9,000	900—1080
Louisville,	27,710	4	7,000	650
Minneapolis,	43,083	29	1,500	625—900
Newark,	72,173	26	2,750	720—1000
New Orleans,	47,706	1	47,750	600
Portland (Ore.),	35,209	1	35,250	950
Providence,	37,556	11	3,500	730—900
San Francisco,	64,040	17	3,750	900—1020
St. Paul,	30,667	12	2,500	750—1000
Seattle,	36,261	11	3,250	750—925
Washington,	55,607	5	11,000	900

In Providence, the nurses are required to work eleven months out of the year, and are allowed a vacation with full pay during the twelfth. In all the other cities of Group II the nurses appear to be employed upon a 10 months' basis. Seattle grants a special allowance to each nurse of $3 per month for carfare. The five nurses in Washington include one who is colored.

GROUP III TABLE No. 3.

Cities	School Enrollment	No. School Nurses	Approximate No. Children per Nurse	Salary of Nurses
Albany,	13,593	8	1,750	$750
Atlanta,	26,367	4	6,500	840
Bridgeport,	20,000	..	.....	.....
Cambridge,	17,349	3	5,750	800—1000
Camden (N. J.),	17,000	2	8,500	720—800
Fall River,	23,830	2	12,000	750
Grand Rapids,	16,680	4	4,250	.....
Houston,	20,000	5	4,000	.....
Nashville,	19,221	1	19,250	1020
New Bedford,	14,700	3	5,000	850
New Haven,	28,766	7	4,000	750
Oakland,	21,810	8	2,750	1020
Paterson,	27,000	2	13,500	900
Reading,	15,345	5	3,000	500
Richmond,	29,075	8	3,750	720—810
Rochester,	30,319	9	3,250	700
Salt Lake City,	24,000	8	3,000	.....
San Antonio,	18,166	2	9,000	.....
Scranton,	22,000	4*	5,500	65 per month
Spokane,	16,369	3	5,500	1000
Syracuse,	22,014	8	2,750	790
Toledo,	31,000	5	6,250	650—750
Trenton,	15,195	9	1,750	600—850
Worcester,	24,228	1	24,250	850

*Hired only while the medical inspections are being conducted: they are members of the District Nurses' Association, and are not primarily school nurses.

Atlanta, Nashville, Oakland and Spokane employ their nurses for the entire year of 12 months; in each of the other cities in this group they are hired for a 10 months' period of service—with the possible exception of San Antonio, from which city the returns on this point are not clear. Oakland defrays the transportation expenses incurred by the nurses in their "follow-up" work. In the case of Bridgeport, the answers are very carelessly inserted; according to the returns there are "about 25" nurses, with salaries unstated. Fall River, in addition to the two nurses credited above, reports that "although there are two nurses a part of whose duty is school work, a philanthropic organization, the District Nursing Association, which employs 12 nurses, follows up all defects and abnormalities found in school children." The 5 nurses credited to Houston are also employed by outside organizations, but "work through and coöperate with the schools and the school physician." In Trenton, the maximum salary of $850 is subject to further increases for nurses who take advanced professional courses of study.

GROUP IV. TABLE NO. 4.

Cities	School Enrollment	No. School Nurses	Approximate No. Children per Nurse	Salary of Nurses
Akron,	23,000	9	2,500	$900
Allentown,	10,800	2	5,500	1000
Altoona,	8,915	0	.....	.....
Atlantic City,	9,125	3	3,000	1850 (total)
Augusta (Ga.),	6,000	1*	6,000	.....
Bay City,	10,700	1	10,750	.....
Bayonne,	11,794	2	6,000	900
Berkeley,	6,000	1	6,000	2000
Binghampton,	8,000	2	4,000	800
Canton,	10,290	1	10,250	1000
Charleston (S. C.),	7,000	0	.....	.....
Chattanooga,	8,500	2	4,250	300—400
Covington,	5,500	0	.....	.....
Davenport,	8,000	1	8,000	950
Des Moines,	19,609	5	4,000	800—900
Duluth,	14,373	4	3,500	750
Ea. St. Louis (Ill.),	9,554	0	.....	.....
Elizabeth (N. J.),	10,802	4	2,750	650
Fort Wayne,	8,007	0	.....	.....
Forth Worth,	12,269	0	.....	.....
Harrisburg,	12,000	2	6,000	650
Hoboken,	11,312	2	5,750	950
Johnstown (Pa.),	9,500	2	4,750	720
Lancaster,	6,500	0	.....	.....
Lincoln,	9,500	1	9,500	720
Little Rock,	9,327	0	.....	.....
Manchester,	14,975	6	2,500	600
Montgomery,	5,000	0	.....	.....

*Detailed by the board of health from the city department to "look after the health of the school children."

Cities	School Enrollment	No. School Nurses	Approximate No. Children per Nurse	Salary of Nurses
New Britain,	8,000	1	8,000	800
Norfolk,	15,500	5	3,000	660
Oklahoma City,	15,000	0	.....	.....
Passaic,	11,092	1	11,000	830
Pawtucket,	8,142	0	.....	.....
Portland (Me.),	9,705	0	.....	.....
Pueblo (Dist. No. 1),	4,000	1	4,000	1050
Rockford (Ill.),	6,929	4	1,750	800—900
Sacramento,	10,200	0	.....	.....
Saginaw (East),	5,104	0	.....	.....
San Diego,	8,000	2	4,000	1104
Savannah,	13,002	0	.....	.....
Schenectady,	14,010	11	1,250	780—980
Sioux City,	10,000	1	10,000	1000
South Bend,	8,400	1	8,500	800
Springfield (O.),	9,200	1	9,250	700
St. Joseph (Mo.),	11,659	2	5,750	700—850
Terre Haute,	11,217	0	.....	.....
Topeka,	6,400	1	6,500	700
Troy,	7,000	3	2,250	900
Utica,	14,651	3	5,000	900
Waterbury,	14,970	2	7,500	800
Wilkes-Barre,	12,431	1	12,500	600
York (Pa.),	7,500	1	7,500	.....
Youngstown,	16,535	4	4,250	900

The nurse credited to Bay City is a visiting nurse, whose official title is "Supervisor of Delinquents, Retarded and Sub-normals." The returns from Berkeley indicate that there is a "combination of dental clinic and nurse" (!) in that city, receiving a salary of $2,000. Covington refers to the school nurse as one of its greatest needs at the present time. Health Officer Robert N. Hoyt speaks of recent progress made in Manchester thus: "We have just changed the personnel of our system of school medical inspection from six part-time physicians and three full-time school nurses to one school medical inspector (half-time) and six nurses... A good nurse will detect defective ears, eyes and teeth just as well as a physician, and is much more faithful than the average part-time physician. She seems to handle children more successfully and to win the confidence of the family better."

The Pawtucket schools have no nurses, but a little assistance is generally forthcoming from the district nurses when needed. The Anti-Tuberculosis Society of Saginaw has a visiting nurse who looks after any tubercular children in the schools of that city. York reports "one nurse to look after head (!) troubles principally," but does not report her remuneration. With these additional notes the above table is complete for the 53 cities included in Group IV.

Tables 5, 6 and 7 represent a summary of the important facts established by this section of the study. Comparison of these tables with those given last month, having reference to school physicians in the 100 cities, is interesting.

TABLE No. 5.

Showing the average number of children per nurse in the 81 cities employing school nurses.

No. cities employing one nurse per 10,000 or more children	12
No. cities employing one nurse per 5,000—10,000 children	29
No. cities employing one nurse per 2,000— 5,000 children	35
No. cities employing one nurse for less than 2,000 children	5
Total	81

TABLE No. 6.

Showing those 17 cities† which employ no school nurses. Cities marked with the asterisk (*) have also no medical inspectors.

Group II—Kansas City (Mo.)

Group IV—Altoona—Charleston (S. C.)*—Covington—East St. Louis (Ill.)*Fort Wayne—Fort Worth*—Lancaster—Little Rock—Montgomery—Oklahoma City—Pawtucket—Portland (Me.)*—Sacramento*—Saginaw (East)—Savannah*—Terre Haute.

Total, 17.

†The returns from Buffalo (Group II) and Bridgeport (Group III) fail to furnish the data necessary to include them in either Table No. 5 or No. 6.

TABLE No. 7.

Nurses' salaries in the 81 cities.*

No. cities paying $1,000 or more to each nurse employed	16
No. cities paying $800—$1,000 to each nurse employed	31
No. cities paying $500—$800 to each nurse employed	26
No. cities paying under $500 to each nurse employed	1
No. cities failing to report salaries	7

*The maximum amount paid has been taken as the standard in each case. Thus, Seattle for example, where the salaries of nurses range from $750 to $925 per annum, is included among the 31 cities in the above table, not the 26.

TABLE No. 8.

Showing the average, maximum and minimum number of children per nurse in the various cities by groups.

	Average No. Pupils per Nurse	Maximum No. per Nurse	Minimum No. per Nurse
Group I,	4,250	8,000	2,500
Group II,	10,500*	47,750	1,500
Group III,	6,750	24,250	1,750
Group IV,	6,000	12,500	1,250

From these statistics several conclusions relative to the present status of school nursing in the larger cities of the United States may be drawn:—

*The average in this group would approximate that of the other three were it not for the fact that two cities (New Orleans and Portland, Oregon) with an aggregate school population of 83,000 children have but one nurse each.

(1) Of the 81 cities reporting school nurses, 41 require their nurses to have general oversight of more than 5,000 children; in one city there is only one for 47,750. The remaining 40 cities never show an average higher than 5,000 pupils to one nurse; in 35 of these cities, the nurses have from 2,000 to 5,000 children, and in only 5 does the average number fall below 2,000.

(2) The 17 cities which do not employ nurses fall, with a single exception, in Group IV; *i. e.*, they are cities having a population of from 50,000 to 100,000. Compared with the other cities in Group IV, these 17 by contrast make a poor showing indeed, for with the exception of the 8 Group I cities, the Group IV cities make on the whole the very best showing of all the 81.

(3) Only 6 cities in the whole list have neither nurses nor inspecting physicians. The total school enrollment in these cities amounts to approximately 60,000. Of the 3,000,000 school children, therefore, in the 100 largest cities of the United States, 98% are now under some form of school health supervision.

(4) The most common salary paid for the service of the school nurse appears to lie between $800 and $1,000, 42% of the cities reporting salaries varying between these two figures. There appears to be a tendency in many cities to pay the nurses a minimum wage for the first year, and to give them an increase each year thereafter until a certain given maximum is reached. Thus, St. Paul pays her 12 nurses salaries ranging between a minimum of $75 per month and a maximum of $100 per month. 16 cities pay $1,000 or more, while 26 pay not more than $800 nor less than $500. Only one city reports a wage lower than $500.

(5) The lowest average number of pupils to each nurse is found in Group I, which comprises the very largest cities. This group contains also the lowest maximum number per nurse. The highest average is found in the second group, as is also the highest maximum. The other two groups, including all cities having a population varying between 50,000 and 250,000, are tolerably similar both in average and minimum, and would also be in maximum except for one city in Group III (Worcester) which has only one nurse for approximately 25,000 pupils. As it is, the smaller cities, represented by Group IV, make the very best showing outside the metropolitan cities in Group I.

We conclude this section of the study with a few recommendations bearing upon the subject under discussion:—

(1) The average number of children assigned to one nurse is altogether too high in most of our cities. For a nurse to do a large share of the routine work of inspection as well as to follow up the treatment given in a large percentage of the defects revealed by the periodical examinations, it appears that 2,000 represents the maximum number of pupils, beyond which she should not be held responsible. On the grounds of efficiency, probably 1,000 to 1,500 would be a safer estimate. However, until public opinion has been brought to express itself intelligently, it is doubtful whether the average will not rather approach 5,000 than 2,000. Meantime, it must be remembered that it is the few cities of relatively high school registration and employing only one nurse that are responsible for generally high averages. In the absence of specific legislation, it becomes the duty of these few cities to assume their just share in the furtherance of the general health and efficiency of all our school children.

(2) The salary paid to school nurses will depend, among other things, upon the amount of time which they devote to their duties (*i. e.*, whether 9 months, or 10 months, or 12) and upon their professional qualifications. Trenton has established an excellent precedent in this connection by making her maximum wage for nurses a variable determined by the amount of advanced study they may have devoted to the general subject of educational hygiene. In general, a salary of $80 a month should represent the minimum for fairly competent nurses. With added experience or training there is no reason why this figure should not be increased to $100, or even more. Most cities at the present time employ their nurses for 10 months, or during the school year. Ideally, of course, the nurse will be hired upon a 12 months' basis, for the amount of work which she may accomplish as a health official during the hot summer months is quite unlimited in the average city. She should, however, be granted at least one month's absence, without loss of remuneration. This would obviously mean dividing the corps of nurses in half during the summer, one part remaining on duty while the other enjoys its vacation.

(3) It is a significant and encouraging fact that so many of our cities express emphatically the need of efficient nurses in the schoolroom. It should augur well for the future of this work in America.

(4) Only a very few of the larger cities report the exclusive employment of school nurses in place of physicians. As we pointed out above, there are certain classes of defects among pupils which can only be successfully diagnosed by the physician, and thus the medical expert remains essential in the most successful administration of comprehensive school health work. Still, in innumerable of our smaller cities and in the towns, the future health worker is likely to be the nurse almost exclusively. A large number of towns have already organized the work under one or more nurses, and with excellent results. The number of serious organic defects found among the pupils of smaller cities and towns is naturally small, and whenever they are come upon by the nurse they can be easily referred to some local physician for further analysis. Thus, in whichever direction we turn, the future sphere of the school nurse becomes more and more inclusive. We need at least 10,000 nurses in the United States at the present time. We have facilities for training only a relatively small portion of this number, although as the demand increases the supply will without doubt be forthcoming.

(NOTE: Next month's article will be devoted to the status of the "SCHOOL CLINIC" in the 100 cities.—Ed.)

MEDICAL SUPERVISION OF RURAL SCHOOLS*

THE TEACHER'S RESPONSIBILITY

BY LOUIS W. RAPEER,
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Vision and Hearing Examinations. For making a complete and thorough examination, the teacher should probably begin with vision and hearing. For the vision examination she can use the chart furnished in the volume on Educational Hygiene or can get the smaller test charts. The chart containing the letters of four lines will usually be sufficient to detect most vision defects, especially if the teacher watches for the other symptoms, such as strained eyes or nearsightedness, as given in Dr. Hoag's forms. A Snellen test chart, containing these and other letters, should be in every school room, or at least one in every school, and the teacher should be trained as much to do this work as she is to teach spelling and arithmetic. Most of the ailments and defects of school children decrease with age, but vision defects and a few others, such as tuberculosis cases, increase with age, and more and more children will be found defective in this respect as we go upward through the grades until we come to the end of the high-school period, when not far from fifteen per cent. of the pupils of the school should be wearing glasses. It will not be long before we shall be able to say rather definitely how many children of various ages in an average community will be found to be in need of glasses to correct their optical defects. This fact furnishes a serious problem for the teacher, both in the general prevention of eye defects by methods to be suggested, or in diagnosing and meeting the immediate situation with which she is confronted. For children too young to know their letters well, it will be necessary to use the McCallie or other forms which do not require a knowledge of the alphabet.†

For children somewhat older who know their letters, say the pupils of the beginning of the second grade, the Snellen test form may be used. This form should be placed in a good light which will throw the reflection toward the pupil, twenty feet from where the pupil stands. It may be well to have a permanent marked point on the floor of the class room, twenty feet from the wall where the card is hung. It is necessary to keep the pupils from getting acquainted with the letters on the card in any way, so it may be desirable to have the vision tests made a few at a time before or after school, and in such a way that the pupils will not see the card or be disturbed by the vision test when carried on during school hours.

Have the pupil place a card over one of his eyes, say the left, lightly, without pressing on the eyeball. Then test the right eye by asking the

*Continued from last month.

†Probably the best simple directions for the teacher to use in testing vision and hearing are those given by Dr. Freeman in his book on "Experimental Education" (Houghton, Mifflin Co.)

pupil to read the top line of figures marked sixty feet. This line he will usually be able to read quite readily because the person with the normal eye can easily read these letters at three times the distance. Then have him read the letters marked forty feet. If he misses one of them, do not feel seriously concerned, but if he misses all or several of them, say three, he probably either does not know his letters, or his vision is defective. He is shortsighted in the right eye. The defect is called myopia. In this case his vision for this eye would be recorded as follows: r (right eye) = $^{20}/_{40}$, *i. e.*, his vision is $^{20}/_{40}$ of the normal vision. Such a pupil, regardless of whether he has any signs or gives any indications of eye strain or not, should be reported to the parents with the request that the pupil be examined by a competent oculist, not an optician, for vision defects, regardless also of what is found in the test of the left eye, although the test of the left eye should usually be made.

If, however, the pupil can read the line marked forty feet and is defective in reading that at thirty feet, or misses two or more of the letters, the vision for the right eye should be marked $^{20}/_{30}$. If such a pupil does not have serious signs of eye strain, such as inflamed eyes, or headaches, etc., it is doubtful whether he should be reported to the parents as being in need of an examination by a competent oculist, and even if both eyes test as low as $^{20}/_{30}$ it is still doubtful. It is quite common for the vision of children to deviate from the normal; in fact, deviation is the most common and natural characteristic of children. We can not expect to find them all with $^{20}/_{20}$ vision, and probably no oculist would claim that all children should be further examined with vision $^{20}/_{30}$ in defectiveness. However, if $^{20}/_{30}$ vision in one or both eyes indicates an increase of defect over a former test and that probably an examination by an oculist may help the child, the teacher and the parents should have the examination made and resort to such preventive measures as well-fitted and tested glasses, eye hygiene, such as less book reading, better print, better general care of the health, better lighting, and more frequent resting of the eye between reading periods. No attention, however, should be paid to vision defectiveness between $^{20}/_{20}$ and $^{20}/_{30}$, unless there are other signs of vision defects than those disclosed by this chart. Other tests are desirable as shown in Freeman's volume, but they will usually be beyond the classroom teacher perhaps.*

Strabismus. Strabismus, or cross-eye, sometimes called squint, should probably always be reported in young children. It is nearly always possible to treat cases of cross-eye by surgical or other means if the child is taken at the age of three-to-eight years, and appreciably to improve or to correct the condition. It is a public crime that so many people suffering from this defect should be made to go through life without having it corrected, when the means for the correction are usually simple and can readily be procured. If parents are unable or unwilling to do this, then the State should step in and provide free correction of the defect, if necessary, through its compulsory power. It is a child's right and the State's right that this be corrected whenever possible. The defect is usually caused by defective vision in one of the eyes which makes accommodation or mutual adjustment of the eyes impossible. This leads to the use of but one eye and the disuse and gradual atrophy and further draw-

*See also Terman's volume on "The Hygiene of the School Child" (Houghton, Mifflin Co.)

ing inward or outward of the other eye. It is the duty of teachers to do what they can to banish this defect from the child population.

Hearing Defects. Children with hearing defects have frequently been sadly misunderstood and abused. Teachers have wondered at their seeming indifference and their lack of attention. When tested, pupils who have suffered through the schools and at home constantly, have been found to be almost totally deaf and yet have been able to get along, without any one suspecting the condition for several years, by skilful lip reading and general visual perception. As the child with defective vision should be put in a good light and put near the front of the room where the blackboard and other work can easily be seen, so the child with defective hearing should have a place convenient for him to hear with his degree of auditory acuity. School nurses and physicians have many stories of serious conditions of this kind found in our public schools.

The defect is not so common as seriously defective vision, but there will probably be found one pupil in each one or two classrooms of pupils, the country over, counting forty pupils to a room.

The difficulties lie in no definite easily-used instrument and standard for determining defective hearing. It is hard to decide, when hearing acuity ranges gradually over a wide scale and when we have no very satisfactory instruments for use in this work, to make very definite statements. Generally we consider that a child who has defective vision should have glasses or should have some careful attention and correction of vision defects. For hearing, a common-sense standard would be that children should be reported as defective in hearing who have such a degree of defectiveness as makes it desirable for there to be a careful medical examination by an aurist (an ear specialist) and for special care and attention in school and home. The defect can quite accurately be measured if it is taken by the use of the Seashore or McCallie audiometers. The suggestions given by Professor Whipple in Monroe's "Cyclopedia of Education," a set of books which should be in every school of the country the same as the dictionary and the educational or general cyclopedia, will be found helpful in this matter. Freeman's book is excellent. Hearing defects are most commonly caused by ear discharge, an ailment technically called *otitis media.* Most teachers have seen children suffering from such foul discharges of one or both ears. A cold or infection lodging in the throat, in the tonsils, or adenoids, and traveling up the eustachian tube sets up a suppuration of the middle ear which causes earache and which frequently breaks out through the ear drum, or tympanic membrane, into the outer ear. This ailment will be discussed under the heading of common ailments. It is a serious disease and should be put into the hands of skilled physicians. The treatment is long and painstaking. Some of the children at the school clinics take treatment several days a week throughout a whole year before being cured. Parents are usually ineffective in giving treatment with the result that many children become deaf in this manner or have a disease called mastoiditis, an infection in the bone cavity back of the ear.

A simple method of testing for hearing is the *whisper test.* The pupil is stood a distance of twenty feet with his back to the teacher, who whispers to him in a normal whisper several words and figures for him to write down on a piece of paper, or several directions of things for him to do, such as holding up his right hand, touching his head, etc. It is

possible in certain cases for teachers or nurses to examine several children at a time (in concert) in this way, when care is taken that pupils do not see what the others do. With the dictation test, four or five pupils can be thus examined at a time. Another test is the *watch test.* The pupil is stood three feet away from an ordinary, or stop, watch held on a level with his ear and is asked if he hears it. If he does not it is brought nearer, if he hears it very plainly it is taken farther away. If he can not hear it at a distance of two feet, he is probably defective in hearing and should be examined by a physician perhaps for a diseased condition. A stop watch is preferable to an ordinary watch since it makes it possible for the teacher to ask the pupils if they hear it when it is not running. Often pupils will say they hear the watch and imagine they hear it less and more easily when they do not hear it at all. The ordinary watch, of course, can be used in such a way as to check up the accuracy of the pupils answers. For example, the teacher may close it up in such a way as to stop the sound. The standard used in the whisper test should be stated on the pupil's record, *e. g.,* "whisper test and watch test," or just "watch test." Frequently a careful teacher and the pupils will discover many children with serious hearing defects by the ordinary activities of the school life.

Teeth Defects and Mouth Hygiene. Practically all diseases are of germ or microbe origin and the usual place of entrance into the system is the mouth. Bad mouth hygiene makes good chances of microbe infection. This is especially true of decayed and defective teeth. Several of the forms of dental defects are actual decay of the teeth, mal-occlusion, or imperfectly fitting together of the teeth of the upper and lower jaw, irregular teeth, bad condition of the gums, and other such dental conditions. The most serious, of course, is decay.* Dental decay is an extremely common defect or ailment, both among children and parents. It has been called the great "Peoples' Disease." Dr. Osler asserts that it causes annually far more suffering and loss than is occasioned by alcoholic liquors. If we had what we probably should have, thorough-going physical examinations of all the people of the country every three years or more frequently, it would be found on the first examination that probably seventy-five or eighty per cent. of the people of this country have decayed teeth serious enough to require immediate dental care. Half or more of the men offering to enlist in military service are rejected for defective teeth alone. Among the school children dental decay afflicts in a serious way not far from two-thirds of all the children in the public schools.

Such decay is a serious matter not only because it brings about pain through ache, the improper mastication of the food and consequently malnutrition, the loss of the teeth themselves, foul breath, and other disagreeable conditions, but it has been fairly well proved, and is the general conviction of medical men in the dental profession, that decayed teeth are a good breeding place for pathogenic organisms that tend to spread to other parts of the body, and when the vitality is low, the bodily resistance weakened through disease, malnutrition, overwork, or other causes, tend to begin their growth in the weakened tissues of the

*On this subject, as well as regarding most other defects of school children, Professor Terman's book on "The Hygiene of the School Child" will prove of great value to the teacher.

body. It is highly probable that several infectious and non-infectious diseases of germ origin pass into the body and set up their disease-forming action largely because of the favorable mouth conditions, chiefly of the kind mentioned. Dental decay frequently means diseased tonsils by direct microbic infection and many diseases undoubtedly enter the system through the tonsils. Enlarged, diseased tonsils which frequently mean enlarged adenoids, enlarged glands in the neck which frequently break down and become tubercular, lead the spread of the infection up the eustachian tube causing the disease previously mentioned; and the germs of decay and other microbes being swallowed with the food and saliva passing down the alimentary tract undoubtedly have an injurious influence. It is probable that tuberculosis may get into the tissues through these avenues and spread from the enlarged cervical glands to the bones and the lungs causing consumption. The truth about this matter has not been fully discovered and rests entirely upon more careful study and investigation by experts in this field. Mouth hygiene is, however, valuable for its own sake, like personal cleanliness, regardless of whether decayed teeth bring on other ailments, and we should practice and direct the best mouth hygiene and keep the teeth in first-class condition just as we practice a decent amount of bathing and insist upon the eradication of pediculosis (head lice) from the hair.

The symptoms of teeth defects are given in the health survey mentioned above, and on the symptoms chart. Teachers can have a remarkable practical influence upon this fundamental form of personal hygiene by simple methods of developing right mouth hygiene among pupils. For example, by the daily questionnaire method it is many times possible for the teacher to awaken in the pupil a sense of the importance of the use of the tooth brush and of going to the dentist when the teeth ache or of making an annual visit for a dental examination, regardless of signs of decay. Ask your pupils each morning how many brushed their teenth, slept with their windows open, drank coffee for breakfast, etc. It is possible for teachers to secure for the pupils good tooth brushes for their own use. They may be purchased in quantities by the schools and distributed at small sums, which can be raised coöperatively by the pupils. Two, at least, of the large dental supply houses of the country are at the present time furnishing free lecturers to schools who administer mouth hygiene and awaken a sense of its importance, give out free samples of tooth paste or powder, and in some cases even tooth brushes, to the children.

Many school systems have had such lectures for all the children in the schools. It would be much better, of course, if such lectures could be given by the school officials themselves, by the teachers or by specialists in the schools. In many class rooms of the country teachers have instituted tooth brush drills, and children are taught how to use their tooth brushes, and are then followed up in one way or another to see that the practice is contined. In many cases the parents must be directed by various means to support the work and help to initiate and to perpetuate the desired habit. Certain races, such as the Italians and negroes, seem to have better teeth than the whites, regardless of mouth hygiene, and frequently scoff at the attention being paid to teeth. Heredity is a big factor. The practical truth, however, probably is that mouth hygiene is as important for them in saving their teeth under modern conditions as for other races. The decay may not be so frequent or so common, but is in-

evitable and should be met by the means suggested, even though less common, not only because of the protection, of course, against decay or loss of teeth, but for reasons of personal cleanliness and decency. In one or more of the normal schools of the country the teachers have recently been taught the principles of mouth hygiene and in Dr. Dresslar's book on "School Hygiene" one may see a photograph of the teachers of the University of Alabama Summer Session at their mouth drill.

These three common ailments and defects as they are to be met by the modern school teacher are typical of this whole work of health examination, prevention, treatment and cure. If I have suggested the importance of the problem, the sources of information, and some practical ways of meeting the responsibility, my purpose is accomplished.

BOOK REVIEWS

HEALTH AND DISEASE, *Their Determining Factors.* By Roger I. Lee, M. D., Professor of Hygiene in Harvard University and Visiting Physician, Massachusetts General Hospital. Boston, Little, Brown and Company, 1917. 378 pp.

This book is worthy of a place in every man's library, whatever his class or occupation. In recent years medical science has made many marvelous achievements and reached many exact conclusions. In *Health and Disease* Dr. Lee has endeavored to place before the layman a fairly complete symposium of the diagnosis, prevention and correction of the innumerable disorders and defects to which mankind is subject. "Theoretically," he says, "all disease is preventable. Such an assumption, however, implies the complete knowledge of the causes and determining factors of disease and the application of that knowledge. This is an ideal state of affairs which is far removed from actual practice, although it is true that our knowledge concerning disease is far ahead of our application of it... Statisticians have estimated that there are yearly in the United Sates over 600,000 deaths which might have been prevented; that over a billion dollars is wasted annually through unnecessary illness and premature death, and that, on the average, fifteen years of life are lost through the lack of application of the available knowledge concerning health and disease..." The chapters on *Heredity, Food, Exercise and Work, Hygiene of the Mind, Occupational Diseases,* and *Functions of Boards of Health* are extremely interesting and suggestive. There is a brief section devoted to children's diseases, but the emphasis throughout the book is placed always upon the adult.—E. C. A.

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WHAT OF MILITARY TRAINING IN OUR SCHOOLS?

BY LAWRENCE AUGUSTUS AVERILL

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The report of the Committee on Military Education of the Department of Superintendence of the National Education Association was presented before that body at its recent meeting in Kansas City. The Committee was instructed a year ago by the Department to "report upon the proper place for, and purpose of, military education of American youth," and the results of their study should be of no little moment in shaping our future national policy in this regard. Space and the general aim of this paper will not permit a complete analysis of the Committee's report, yet it contains so many important conclusions that I venture to mention a few of them at the outset.

In the first place, says the report, military training is infeasible in either the elementary or the secondary schools because boys under 17 or 18 years of age are too immature physically to perform satisfactorily the arduous work of training and too immature intellectually to grasp fully the significance of the training and its responsibilities, or to take it seriously. In the second place, just at the time when military enthusiasts would force the boy into military training—somewhere between the ages of 12 and 18—the adolescent period is at its height, and the adjustments and life-changes that are normally transpiring may be most seriously disturbed by the exactions of military training. Third, the amount of time demanded of the pupil to make his training really worth while would be so great that it would interfere with his progress in his school course and with any vocational education which he might otherwise contemplate. Then, too, by subjecting secondary school pupils, or indeed any selected class of pupils, to military training, and relieving others of it, the duties of the national defense will devolve upon the better-educated class, while the poorer will quite escape.

Continuing, the report cites abundant corroboration of its position in the practice of the leading nations of the world. The great military nations, Germany, France, England, Russia and Japan, have not relied on the military training of boys. The military system of Switzerland, which is often commended as peculiarly appropriate to this country, requires military service of men over 20 but does not require military training of school boys. In our own country, New York is the only state which has adopted legislation providing for the compulsory military training of boys—and the report registers its disapproval of the enactment. As further substantiation of its position, the Committee cites the reports of the Special Commission on Military Education and Reserve of Massachusetts, of 1915, and the Commission on Military Training in High Schools of New Jersey, of 1917, both of which, after thorough investiga-

tion, rejected the military training of boys as inadvisable. Among other things, these commissions have demonstrated that military drill gives almost no stimulus or inspiration for actual service; that the weight of opinion of teachers, military experts, officers of the regular army and militia as well as the general public is overwhelmingly against military drill; that neither obedience nor ideals of conduct as such are fostered by such training; that patriotism is not appreciably developed thereby; and finally that the amount of physical training which is afforded is no greater than might be realized in any good course in physical education. In this connection, Dr. Dudley A. Sargent, of Harvard University, Dr. W. E. Darby, of London, Ex-President Charles W. Eliot, and Capt. H. J. Koehler, instructor in physical training at the West Point Military Academy, are all quoted at some length as condemning military drill as a particularly valuable form of physical exercise.

The Committee's chief conclusions are as follows:—

...To be specific, we favor a course of military training which shall be universal and obligatory for all young men of nineteen years of age and over who are physically qualified, which shall be required of them at some time during the twentieth and twenty-first year, and which shall be maintained, directed and paid for by the federal government... As the military service toward which the training looks must be made efficient and must be rendered in behalf of the whole country, the training should be administered under national direction and at national expense.

We feel compelled, moreover, to say that if we must prepare and train men to be soldiers, our legislatures, national and state, must not evade the issue by shifting the burden to the shoulders of school boys, but should frankly and courageously place it where it belongs.

...Your committee must urge most strongly the pre-eminent importance of thorough physical training to all pupils of the schools and to the men and women of the country. Your proceedings and the expression of all thoughtful teachers have for years shown that the need of it has been recognized and urged by those who are directing the work of the schools and has not merely been made evident by present conditions. The present apparent imminence of the call for physically competent men has compelled an analysis of the results of agencies which provide them and has accentuated our educational deficiencies.

It is true that physical health and strength are emphasized in all schools and that thorough physical training is given in some; but your committee recommends that a most comprehensive plan of bodily training, health protection and sanitary precaution be provided by all the states, through statutory enactments, for all pupils, and that all the instruction and exercises included in such a plan be made obligatory upon all pupils, boys and girls, of all ages who attend the schools.

Among the 6 final conclusions and recommendations of the committee these three have to do with school health work:—

(1) A thorough and comprehensive plan of *physical training* should be provided and made compulsory upon all boys and girls of all ages attending the schools, and at the same time provision should be made for the extension of a similar kind of instruction to young people who are not in school through evening and continuation schools, recreation and community centers, and other agencies that may be established.

(2) Special attention should be directed to *personal hygiene*. This should include the care of the body, frequent and thorough *compulsory*

medical inspection, and a consideration of the laws of health, strength and vigor.

(3) Provision should be made for *instruction in sanitation and safety precautions* for the purpose of guarding against disease and injury.

With the general tone of the report and with the recommendations included in it this JOURNAL is in most hearty accord. Military training to be efficient and worth while as a *bona fide* preparation for trench life and the firing line demands a tolerable degree of physical maturity, vigor and hardihood. Far from being capable of being meted out within the limits of a school yard and an already overcrowded school day, military training is only to be had by an intensive period of disciplinary drill at some mobilization point where a sufficient number of officers may be centered to handle several thousands of young men from all quarters of a given state and to equip them with a reasonable working knowledge of military science. It seems to us that the attainment of the age of 19 years, as the committee suggests, is a *sine qua non* for the arduous work that must needs be essential in any system of national military training that is worthy the name.

Meantime, that is during the school period, a thorough and universal system of educational hygiene must be relied upon to keep our boys and girls physically fit—in the one case for the exactions of military training at 20, and in the other, like the girls in ancient Sparta, for the impress which they are to exert upon future generations. It appears, therefore, that physical fitness to undergo military training is directly dependent upon, as it is also the logical consequent of, school health work. Indeed, without the latter to foster and direct the early growth and development of all school children, only the few who are naturally robust can ever be called upon for the former. Our medical inspection statistics are revealing the astonishing fact that three-fourths of all our public school children are physically defective in some form or other. It is a law well established by our mortality statistics that one-half of all the children brought into the world succumb to some disease before ever the proposed age for military training arrives! It is a knowledge of just such alarming conditions as these that is inspiring school and child hygienists everywhere to cast the gauntlet in the teeth of all manner of juvenile disease and defect, and to promote and set on foot agencies designed to reclaim and conserve the health and the wealth of youth.

Almost exactly 18 years ago, England sent out a call for volunteers to aid in quelling the uprising of the Boers in South Africa. Actuated quite as much, doubtless, by a lust to see something of the world as by the stirrings of patriotism, thousands of young men answered the summons—most of them only to be rejected by the medical examiners as unfit for military service because of some form of physical incapacity or defect. The parallel between England's problem and our own present one hardly needs to be suggested. Much as our War Department has needed men, it has been able to accept less than 21% of those who have offered themselves for enlistment, while of those seeking enlistment in the Marine Corps, only 9% have been accepted. What did England do to meet the problem of conserving her young manhood that revealed itself to her thus keenly for the first time? She immediately set investigations on foot into the exact physical status of her school children, for it was very evident that in order to get at the heart of the situation she must start with the child in the schoolroom. The investigations established beyond the

question of a doubt that the one great cause underlying the wretchedly poor physical showing made by England's young manhood was the almost utter neglect of the physical condition of England's childhood. The logical conclusion was that a minimum of preventive and corrective hygiene during the school period would guarantee a maximum of physical health and competence to the citizens of the next generation. The results were as far-reaching as they were significant. Universal, compulsory medical inspection, school nursing and school sanitation were the first fruits of the awakening, and an earnest public opinion in support of school health work was aroused almost overnight. England had lagged behind the continent in the prosecution of this work; she now received a new impetus and immediately threatened to outstrip the great countries of Europe that had already organized for this service. We in America, always quick to follow the educational leadership of the old world, rather perfunctorily began to imitate, and school health work became slowly an accredited aspect of our educational policy, notwithstanding the fact that the public consciousness of our people has never yet been aroused to appreciate the situation.

But thus far our work in this new field has been largely haphazard, unorganized and purely voluntary. We have not felt deeply the need of special provisions and special budgets. We have failed to mark the suggestive parallel between the physically unfit school child and the physically unfit soldier. We have accepted silently the reports so often made to the effect that three-fourths of all school children are physically defective and that three-fourths of all applicants for admission into the army are similarly defective. It is only in a national crisis such as the present one that these facts are driven home to us in their true perspective. If the crisis develops to more alarming proportions we shall come to feel all the more keenly that, in the last analysis, the real potential bulwark of a nation is the child in the schoolroom, and that it is largely his opportunities for correct, robust development that measure the ultimate home defense of a people. Germany has long appreciated the truth of this, and has provided a system of medical supervision of children which in effect begins with the birth of the child and extends throughout the entire period of childhood and youth. The efficiency of her men in the field and the fact that exemption from military service on the grounds of physical unfitness has been almost unknown in the history of German militarism are both made possible by this close watch over the physical development of every pupil in the school system and out of it. We have marvelled that Germany has been able to put 12,000,000 soldiers under her colors—one person out of every five in the whole Empire. Making due allowance for all those who are under or over the strict military age, the ratio still remains appalling and we can only account for it in terms of the indefatigable labors of the German educational hygienists and school health supervisors, who are directly responsible for the physical aptness of every boy up to the time of his period of military service.

I cannot better conclude this plea for a more efficient and better organized system of educational hygiene in our own country than by making three very specific recommendations with reference to the immediate future of this very important and significant phase of educational work:—

I. Every city in the United States and every rural county or other rural unit should have an accredited department of hygiene administered

by one or more competent men and a trained corps of assistants. This department should be in closest touch with the school organization and should include all the local agencies and means of protecting the health of the school child. Reference to the preceding numbers of this JOURNAL will indicate that already most of our cities and many towns have medical inspection and school nurses, but that in a large proportion of cases they are under the control of the board of health. This, as has been there pointed out, is quite wrong. Educational hygiene should be a dignified department by itself, planning and directing the medical inspection and "follow-up" work, making school health surveys, examining the sanitary appointments of school buildings, conducting free clinics for all needy children, directing the teaching of hygiene done in the schools and equipping teachers with the material and training for doing it, reporting to the public frequently the results of its studies and its activities, and administering such other details as fall naturally within the province of school health officials.

II. Every state in this country, following the leadership of Minnesota, should have a division of hygiene in closest connection with the department of education. A thoroughly trained school hygienist should be in charge of the work done by this department. Its field of effort would naturally include the agitation of needed legislation, state-wide surveys of the sanitary condition of school buildings, of the health of school children, and of the actual workings of such laws relating to educational hygiene as are already upon the statute books, the general direction and oversight of city and rural departments of hygiene, the collecting of statistics for the national department, the arranging of courses in hygiene for the grades and suggestions to teachers for conducting them, together with such other administrative details and functions as might be in conformity with the task of directing the general work of educational hygiene throughout the several schools of the state.

III. The time is now ripe for the creation in the United States Bureau of Education of a special department of educational hygiene, to be conducted by one or more specialists under the direction of the Commissioner of Education. The work which such a department could do in the way of comparative study of various systems both at home and abroad, special comparative surveys, directing newly organized state departments, and working toward a relative standardization of the work in all the states, conducting tests and experiments in school sanitation, the issuing of bulletins and reports, and the encouraging of a general literature upon the subject, is quite unlimited.

In other words, the first step toward an ultimate solution of the problems of educational hygiene lies in carefully organizing the work on a practical and efficient basis. To sum up the whole matter, we cannot as a nation hope to measure up to the standards of other nations unless we lay more stress in the future upon the correct physical development of the race than we have deemed necessary in the past. Under present and near future international conditions, America needs and will need strong and well-trained men for her armies—and no man can say how many. Universal and systematic health work throughout the entire school life of the child is necessarily the one unfailing agency in raising up a physically robust race, and thus in supplying this need.

(NOTE: The article entitled "The School Clinic" will appear in our May number, it having been deemed advisable to devote the space originally reserved for it in this number to a discussion of the preceding topic.—Ed.)

TEACHING HYGIENE AS NATURE STUDY IN THE ELEMENTARY GRADES

BY F. M. GREGG
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The "blessed trinity of chance, accident, and mistake" is apt to be operative in the pioneer days of all great movements. The conviction is now widespread that much of the futility and unpopularity of physiology and hygiene in the grades is due to the unhappily chosen matter and the unprofitable manner of presenting the subject to its supposed beneficiaries. The matter has been too technical and the manner has been too exclusively bookish. There has been lack of proper motivation, the topical presentation has been logical rather than psychological, and the appeal has been remote and individual, rather than immediate and social. Many schools have, however, been struggling for the better things along these lines, among them the training school of the Peru, Nebraska, State Normal School. In this institution an effort has been made in the last few years to work out a more satisfactory course in hygiene (no attempt is made to teach physiology below the ninth grade), with the result that while the course is not yet entirely satisfactory the pupils as a whole in the fifth, sixth, seventh, and eighth grades, in which the work has been done, have come to regard hygiene as their most interesting and important subject.

More recently, the writer has modified the course so as to adapt it to the uses of the schools of Nebraska, and this course has been published with considerable additional matter in a bulletin issued by the Nebraska Department of Education, Lincoln, Nebr. The remainder of this article contains liberal quotations from that bulletin.

In content, the Nebraska hygiene course has been greatly changed in the direction of more exclusive attention to hygiene. Hitherto a great deal of emphasis has been placed on anatomy and physiology as desirable bodies of knowledge for the elementary school pupils. This has been particularly apparent in the character of the earlier textbooks provided for the pupils, and in the corresponding nature of the examination questions given to eighth grade pupils. The futility of attempting to teach the rather technical aspects of the subject to immature minds, becomes easily apparent in the usual answers to eighth grade examination questions. The following are typical answers taken in the spring of 1916 from the pupils' papers in one of the best educational counties in Nebraska, and the inference is plain:

"A common disinfectant is smallpox."
"Mastication is what is going on."
"Epidermis is a certain kind of medicine."
"The diaphragm is another word for backbone."
"The bones are made up of hard mucous membrane."
"Pericardium is something that will put you to sleep."
"Respiration means all the different juices in the body."
"The diaphragm is very delicate and is located in the head."
"Fumigation is when the air is shut off and death may come."

"The Eustachian tube is a tube running all over the body."

"The nervous system is a kind of tube where the blood vessels are in."

"The process of digestion causes headaches and much impure blood. Fried potatoes often causes digestion."

"The way to treat a burn is after I burned it I would put my finger on the stove just where I burned it before."

"A disinfectant is anything you catch by going where they are. Measles and chickenpox are disinfectants. When you have them you should stay in the house and keep warm and try not to give them to others. Pimples on the face are not disinfectants but some kinds are."

A widespread feeling of revolt against the futile physiology grind in the grades finally led to the adoption of the following resolution by the Nebraska State Teachers' Association at its meeting in Omaha, in November, 1915:

"Coincident with the widespread movement for bringing the public school curricula into closer parallelism with the present-day needs of the individual and of the community, and in response to the general demand for more serious and effective attention to the physical well-being of the rising generation, we recommend that more attention be given in the upper grades of our elementary schools to the teaching of practical hygiene and sanitation, and that the teaching of physiology, as such, be transferred to the high school for a full semester of serious study with substantial laboratory work as an essential adjunct."

In harmony with the spirit of this resolution and the constantly growing demand of the people, the new course of study was formulated which attempts to obviate, at least in part, some of the serious difficulties that have arisen in the effort to provide health instruction in the common schools of the state.

But if instruction in hygiene and sanitation is to achieve what it was originally designed to accomplish, a change in method of presenting the subject is quite as important as the change in content or matter. In the light of the examination answers quoted above, the older teaching of hygiene stands impeached, not only for its matter, but for its method as well. Manifestly the pupils had not had the sense-experience necessary properly to imagine or appreciate the things written about, and the method had been a too exclusively bookish one. It is, of course, impossible to imagine anything the elements of which have not come into the actual experience of the individual.

The remedy naturally lies in an inductive approach to all the major topics of the course. Let *things* be studied first and *books* afterward. An effort to make clear what is herein implied is attempted in the concluding part of this paper; and teachers of hygiene are earnestly invited to try to absorb the general spirit of the subject as there illustrated.

There is still a third point of departure from older procedure, the importance of which it is hoped the teachers of elementary schools will fully sense. This point is one of so devising the health work of the schools as to develop health habits among the boys and girls who come under the influence of our schools. For the pupils merely to be able to say over the words of a book, or to re-echo a list of health platitudes, is not necessarily to guarantee a vigorous and efficient life. To be able to pass an eighth grade examination in physiology has too often seemed to be the end of the instruction in hygiene. This is, however, only incidental to the real

aim, namely, the development of a set of habits that will function in the life of the child and adult.

This ability to do what ought to be done to conserve health, and the habituation to proper health practices, constitute the real test of effective hygiene teaching.

Children of school age do not, ordinarily, have any particular interest in health as such. Yet it is also true that the general outline of a child's character is pretty well established by that age. The problem of health training, then, becomes the imperative one of developing desirable habits in a field in which the natural interest of the child is small. How can this be done?

In the first place, it is important that the school administration in general, and the teacher in particular, shall see to it that the environmental conditions of the pupil in school are such as to make it easier for the child to get right health habits than wrong ones. With her part of these details the teacher needs to so saturate her consciousness that she will have a feeling of "wrongness" about the schoolroom when any one of them is being neglected.

In the second instance, since the pupil cannot be directly interested in health practices, he must be indirectly motivated to take them on. The approach must therefore be made through certain of the child's natural tendencies. The more important of the "springs of human action" are indicated in the following paragraphs:

A child loves to "do something in order to have something happen," says Thorndike. Since *what* he does at such times is of secondary consequence to him, the teacher can take advantage of the fact and set him to doing something worth while for health-habit ends, and at least temporarily turn the flow of his energy away from the formation of undesirable habits. Volley ball, for instance, is a better form of activity than marbles.

The human child is the imitating animal par excellence. If the teacher commands his respect and confidence, imitation of the teacher is inevitable. A fine primary teacher in Hyde Park, Chicago, whose physique and carriage were ideal, said to her pupils one morning in the presence of the writer of these lines, "How many little soldiers have I this morning?" Instantly the children seemed to take up the natural poise of their teacher and this condition continued during the whole of the hour they were under the writer's observation.

A child is highly suggestible. That is, he uncritically accepts ways of doing things new to his experience, especially if they are indirectly approved by some one or more in whose judgment he has confidence. A teacher wanted to develop the toothbrush habit in certain of her pupils by the suggestive method. She accordingly posted up by the school washbowl an attractive advertisement picture of a child cleaning his teeth with a brush. A few days after this, one of the most needy of her pupils said to her, pointing to the picture, "We got one o' them brushes at our house now, and we all use it!"

Play is a deeply rooted tendency in child life. It is because Mrs. Stoner took fullest advantage of this fact that she was able to accomplish the remarkable intellectual and healthful development of her daughter, Winifred Sackville Stoner, described in her book, "Natural Education." Many desirable health habits can be started by incorporating them into a game, and many undesirable ones can be broken up in a similar way.

As an example of the first sort, a teacher taught her pupils to use a toothbrush properly and to do other acts of the morning toilet, through a game called, "Getting ready for breakfast." The class was divided into two contesting groups and the various acts were done in pantomime, the tooth brushing, for instance, being shown by a twisting motion of the hand in its position for using a brush on the teeth so as to make the brush work the long way of the teeth as well as crossways. The sides did the acts alternately and the teacher was "umpire," checking against each side for each of its individual errors. Such a game is capable of indefinite extension.

An instance of inhibiting bad habits through the use of games is the case of the teacher who broke up the practice of moistening the thumb with the tongue when turning the leaves of a book, or handling papers. This game involved a contest to see who of the class could find a certain page the quickest, all having the same book. If any one wet his finger in the common way, he was out of the game till another page was sought for. The game was varied by requiring the picking out of ten cards most quickly from a pack of authors' cards.

There is a chance for some ingenious school teacher to distinguish herself and render a great educational service by developing a set of health-habit games and by suggesting appropriate dramatizations of health lessons.

One of the most potent of the springs of human action is the love of approbation, or the instinct of self-assertion. This instinct crops out conspicuously when either children or grown-ups try to "show off." What child, or what adult, for that matter, who has said or done something "smart," does not try to repeat his act at the first opportunity? This tendency to play "smart," or be "stuck up," or get into the limelight, is a primitive exhibition of the instinct in question. Refined behavior requires that we suppress this tendency, or at least cover it up as much as possible; yet it undoubtedly lies at the basis of a good deal of our social and even moral behavior, else whence the potency of the idea, "What'll folks think?" when we are contemplating some doubtful social act. The specific point about this matter is that the teacher can make more progress in teaching practical hygiene by the social appeal, and by invoking group influences than by any other means.

Into the psychic background, or original nature of the pupil, which we have been mainly considering thus far in this article, the nature-study method of presenting the subject of hygiene seems both in theory and in practice to be best fitted. In the Nebraska course, the formal study of hygiene begins in Grade V, in which the general theme is, "Habit Hygiene." For Grade VI, the topic is, "Germ Hygiene"; for Grade VII, it is "Community Hygiene"; and for Grade VIII, the topic is entitled, "Human Body Hygiene," this term being adopted to escape the use of the word "physiology."

The time arrangement in Grade VIII, from which we select our illustrations, is intended to correspond with that in Grades V, VI, and VII, namely, about eighty recitations of twenty minutes each. This means a half year's work, which may be given either the first or the last half of the school year; or distributed through the year in alternation with other subjects. If it seems wisest to join Grades VII and VIII for the work in hygiene, then of course the year's work would start in with the work for Grade VII and close with that for Grade VIII.

The fourteen-year-old boy or girl has reached a point in development in which, to a constantly enlarging social horizon, there is added an appreciation of the reason of things. The facts of life must now begin to take shape in some system. This systematization of knowledge is still a crude one, but it must serve as a basis for the scientific structure of later years. It is exceedingly important, then, that the foundations be laid on a concrete footing of actually observed facts and experiences.

This year's work should accordingly be so shaped as to lead up naturally to a study of elementary physiology in the High School. It should not, on the other hand, attempt the technicalities of the great and complex subject of physiology. Experience has abundantly shown that efforts of this latter sort are futile, not to say injurious. The aim, then, becomes one of leading the pupil as far in the direction of physiology as can be fully sensed and appreciated by him, and no farther. The course is accordingly organized as closely as possible around the fundamental functions and activities of the human body, while confining the study to those limits within which the ordinary schoolroom and home life afford opportunity for first hand studies. The teacher, of course, should be acquainted with elementary physiology, just to keep her from saying a lot of things that aren't so; but she should not try to transfer all her knowledge to the pupil. She should merely provide conditions for growth in the knowledge of the things that constitute the background for hygiene, and then she should give the pupil a chance to grow!

A STUDY OF THE FUEL VALUE OF FOODS

The following tests of food values the writer regards as especially important, keenly conscious though he is, that they are open to criticism by punctilious scientists, of being crude and imperfect. These critics forget that the natural order for gaining knowledge is from the psychological, or imperfect, to the logical or more nearly perfect. While these tests will call for some enterprise in their execution, the labors can be much reduced by enlisting the co-operative services of the pupils, a thing that ought to be done anyway, whenever possible.

If the four tests now to be described can be undertaken simultaneously by four pupils or groups of pupils, it will make an interesting contest—that of seeing which set of conditions can bring the water to the highest temperature.

PREPARATION. The purpose of the experiment is to measure roughly the relative heating power of the organic foods when they are burned. It is a crude kind of calorimeter we are describing.

There are needed for each of these tests three pie pans or pie tins of the larger size, a board about a foot square, some pieces of glass and four ten-penny nails. Lay the glass on the board (to keep the board from burning) and on the glass set one of the pans and drive four nails at equal distances around the pan into the board just enough to have them stand securely, each leaning in just a little over the pan. On the tops of these nails can now be set the rim of the second pan, and the third pan, turned up-side-down, can be used as a lid for the second pan. The "calorimeter" is now complete, except that a cream thermometer, a teaspoon and a tin cup are needed to supply the additional apparatus required.

PROCEDURE. Take a piece of newspaper just the size of a pie pan, pour on its center a completely filled teaspoon of kerosene and spread the oil around a circular area six inches in diameter. In experiment No. 1,

you add nothing else to the kerosene. In No. 2, you add just a quarter-ounce of either corn starch or sugar, letting the starch or sugar be distributed evenly over the oiled patch on the paper, and allowing it to become completely saturated with oil. In No. 3, you distribute just a quarter-ounce of butter over the oiled patch. And in No. 4, you lay down just a quarter-ounce of thin slices of dried beef, very thoroughly dried out, and now soaked with the oil in the pan.

In each of these cases the next thing to do is to pick up each oiled paper and place under it bits of crumpled paper so that the oiled paper with its contents shall lie level with the top of the sides of the pan. With the parts to be burned now in readiness, place the second pan on the nail supports, pour into it just a pint (pound) of water, take its temperature, place over it the cover pan and touch a lighted match to the contents of the fire pan below.

When the burning is complete, again take the temperature of the water in the pans, subtract the temperature value of pan No. 1 from those of Nos. 2, 3, and 4, and the results will be roughly the relative caloric value of proteins, carbohydrates, and fats, a bit of information that is basic in all food considerations.

QUESTIONS ON THE EXPERIMENTS. Is there a characteristic odor to all the burned samples of protein foods? How can you determine whether a sample of mixed food has protein in it? How do you test for the presence of starch in a sample of food? Can you name half a dozen common foods having an abundance of starch? Which is the sweeter, cane sugar or grape sugar? Can you give a good reason for applying the name carbohydrates to the sugars and starches? (Look up the word carbohydrate in a big dictionary.) Mention several common foods that have a good deal of sugar in them. Describe the test for fats and oils. Name several foods with fat or oil present. How would you find out what different foodstuffs are present in bread? Which class of foods, vegetable or animal, has starch commonly present?

Which of the foodstuffs tried out in the calorimeter had the most heating power? How did the other two compare in heat value? What is a pound-Farenheit calorie? If the starch had been all thoroughly burned and none of its heat lost, let us suppose that it would have given three times as much heat. Now, if a man working moderately hard uses up 14,000 pound-Farenheit calories of heat a day, how much starch and sugar should a man eat in a day if five-sevenths of his food should be carbohydrates?

TURNING TO THE BOOKS. With some such concrete background of sense-experience as these studies will provide, the teacher may now fairly expect some real thinking and some sane interpretations of the printed page of the textbook. The mere fact of actually measuring the quarter-ounce units of food called for will give the pupil a conception of quantities that few grown-ups possess, and an ideal daily ration of 15 ounces of carbohydrates, 3 of fats, and 3 of proteins, can now have a real meaning.

If the interest has been keen in the work outlined, it will be a comparatively easy matter to induce the pupil to weigh up his own average meals, and even, by the aid of data given in the textbooks, to calculate the weights of primary foodstuffs in the dry-weight equivalents of the foods devoured. The wastefulness of Americans in their excessive meat-eating becomes vitally apparent to the pupil instructed in these ways, and the

background has been laid for an intelligent and interested study of the books as they deal with the highly significant topics of foods and feeding.

CRYSTALLIZING RESULTS IN A NOTE BOOK. A pupil's note book on hygiene should contain all the main points gathered from the experiments and the book study. The teacher should provide an outline for the pupils' books, and the latter should be encouraged, even required, to complete the record in a neat fashion.

HEALTH EDUCATION IN RURAL SCHOOLS*

BY J. MACE ANDRESS

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THE SANITATION OF RURAL SCHOOLS; A SURVEY OF THE RURAL SCHOOLS OF PORTER COUNTY, INDIANA

The bad sanitation in the rural homes is reflected in their public schools. A number of painstaking investigations of the rural schools have now been undertaken. One of the best of these is the survey of the schools of Porter County, Indiana. This county is in the northwestern corner of the state and borders on Lake Michigan. Its principal industry is farming. In this study 75 school buildings were surveyed and medical tests were made of the pupils in 76 schools, including one parochial school, in the rural districts of the county. The survey was conducted by the United States Public Health Service.

The investigation showed that the majority of the school sites had a fair elevation, but that fifty-seven per cent of the buildings were more than 20 years old and therefore not modern in construction. There was no fire-fighting apparatus in any school. Cloakrooms were provided in only 38 per cent of the schools visited. The water used in 75 per cent of the schools was obtained from shallow driven wells. Protection from surface drainage was far from satisfactory. Sanitary drinking fountains were found in 7 schools, but were in use in only 4. Facilities for washing the hands were limited. Common wash basins were provided in 75 per cent of the schools, but were not in use in many. Adjustable desks were found in 9.15 per cent. The light was inferior in quantity and direction. The humidification of the classroom atmosphere was inadequate in all schools, the relative humidity being under 40 per cent in the majority of cases. Among the total number of children reporting on what they had for breakfast only 15 per cent used milk, while 37 per cent used coffee. The physical defects were varied and numerous. Sixty per cent of the boys and 50 per cent of the girls had some degree of dental defectiveness. 18.3 per cent of the boys and 10.5 per cent of the girls never used a toothbrush; 57.8 per cent of the girls used it occasionally, and its daily use was noted in but 13.9 per cent of the boys and 40.9 per cent of the girls.

*A chapter from a forthcoming volume.

To find such conditions in a prosperous and generally progressive rural district is alarming.

AN INVESTIGATION OF THE HYGIENIC CONDITIONS IN TYPICAL RURAL SCHOOLHOUSES IN NINETEEN STATES

Dresslar's more extensive study gives a good idea of the conditions that may be assumed to exist throughout the country. State superintendents of nineteen different states were asked to select two counties in their respective states which they regarded as typical progressive counties. A questionnaire was then sent to all the rural teachers in these counties. In all there were 1,296 returns.

The returns show deplorable conditions. Sixty-three per cent of the buildings are old, and even the newer ones in the majority of cases have been built with little thought of hygiene. The lighting is usually bad and three-fourths of the desks are non-adjustable. The jacketed stove is seldom encountered. Nearly two-thirds of the schools depend for their water supply on springs and wells outside of the school grounds so that neither clean nor fresh water is available in most cases. The open bucket and common drinking cup are still in use, and even when the individual drinking cups are used they are not infrequently allowed to become mixed. The doors and windows of the schoolhouses are seldom screened. Toilet facilities are generally a disgrace and a menace to the health of the community. Not more than 1 per cent of the toilets are sanitary. The school grounds are, as a rule, too small for the children's play. To add to all these unfortunate circumstances the people in rural communities are usually conservative and in little sympathy with progress in hygiene and sanitation.

MINIMUM HEALTH REQUIREMENTS PROPOSED FOR RURAL SCHOOLS

A joint committee on health problems in education of the national council of the National Educational Association and of the council on health and public instruction of the American Medical Association has recently prepared a pamphlet on "Minimum Health Requirements for Rural Schools." These proposed standards should be of great assistance to school boards, superintendents and teachers because they indicate clearly what conditions should take the place of the intolerable situations revealed by surveys and investigations. The minimum sanitary requirements for rural schools are as follows:

I. LOCATION AND SURROUNDINGS

The school should be located in as healthful a place as exists in the community.

Noise and all other objectionable factors should be eliminated from the immediate environment of the rural school.

Accessibility.—Not more than two miles from the most distant home, if the children walk. Not more than six miles from most distant home, if school wagons are provided.

Drainage.—Schoolground must be well drained and as dry as possible. If natural drainage is not adequate, artificial drainage should be provided.

Soil.—As every rural schoolground should have trees, shrubs and a real garden or experimental farm, the soil of the schoolgrounds should be fertile and tillable. Rock and clay soil should always be avoided. If the soil is muddy when wet, a good layer of sand and fine gravel should be used to make the children's playground as useful as possible in all kinds of weather.

Size of Schoolgrounds.—For the schoolhouse and playground, at least three acres are required.[1]

A playground is not a luxury but a necessity. A school without a playground is an educational deformity and presents a gross injustice to childhood.

Arrangement of Grounds.—The schoolground should have trees, plants and shrubs grouped with artistic effect but without interfering with the children's playground or the lighting of the schoolhouse.

II. SCHOOLHOUSE

The schoolhouse should be made as nearly fireproof as possible. Doors should always open outward and the main door should have a covered entrance; a separate fuel room should be provided, also separate cloakrooms for boys and for girls.

A basement or cellar, if provided, should be well ventilated and absolutely dry.

The one-teacher country school should contain, in addition to the classroom:

(a) A small entrance hall, not less than 6 by 8 feet.

(b) A small retiring room, not less than 8 by 10 feet, to be used as an emergency room in case of illness or accident, for a teacher's conference room, for school library and for health inspection, a feature now being added to the work of the rural school.

(c) A small room, not less than 8 by 10 feet, for a workshop, for instruction in cooking and for the preparation of refreshments when the school is used, as it should be, for social purposes.

Classroom should not be less than 30 feet long, 20 feet wide and 12 feet high. This will provide space enough for a maximum of thirty pupils.

III. VENTILATION AND HEATING

The schoolroom should always receive fresh air coming directly from out of doors in one of the following arrangements:

(a) Through wide open windows in mild weather.

(b) Through window board ventilators under all other conditions, except when, with furnace or jacketed stove, special and adequate inlets and exits for air are provided.

Heating.—Unless furnace or some other basement system of heating is installed, at least a properly *jacketed stove* is required. (No unjacketed stove should be tolerated in any school.)

The jacketed stove should have a direct fresh air inlet about 12 inches square, opening through the wall of the schoolhouse into the jacket against the middle or hottest part of the stove.

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1. If the rural school plant includes the additional features (a teacher's home, a garden and an experimental farm), which are already in some progressive states accepted and established as educational essentials, then the schoolgrounds should contain 8 to 10 acres.

The exit for foul air should be through an opening at least 16 inches square on the wall near the floor, on the same side of the room as the stove is located.

A fireplace with flue adjoining the stove chimney makes a good exit for bad air.[2]

Temperature.—Every school should have a thermometer, and the temperature in cold weather should be kept between 66 and 68 Fahrenheit.

IV. LIGHTING

The schoolroom should receive an abundance of light, sufficient for darkest days, with all parts of the room adequately illuminated.

The area of glass in windows should be from ⅕ to ¼ of the floor area.

The best arrangement, according to present ideas, is to have the light come only from the left side of the pupils and from the long wall of the classroom. Windows may be allowed on rear as well as on the left side, but the sills of windows in the rear of the room should be not less than 7 feet above the floor. High windows not less than 7 feet from the floor may be permitted on the right side if thoroughly shaded, as an aid to cross ventilation, but not for lighting.

There should be no trees or shrubbery near the schoolhouse which will interfere with the lighting and natural ventilation of the classroom.

The school building should so face that the schoolroom will receive the direct sunlight at some time during the day. The main windows of the schoolroom should not face either directly north or south. East or west facing is desirable.

Shades should be provided at tops and bottoms of windows with translucent shades at top, so that light may be properly controlled on bright days.

Schoolroom Colors.—The best colors for the schoolroom in relation to lighting are:

Ceiling—white or light cream.

Walls—light gray or light green.

Blackboards—black, but not glossy.

V. CLEANLINESS

The schoolhouse and surroundings should be kept as clean as a good housekeeper keeps her home.

(a) No dry sweeping or dry dusting should be allowed.

(b) Floors and furniture should be cleaned with damp sweepers and oily cloths.[3]

(c) Scrubbing, sunning and airing are better than any form of fumigation.

VI. DRINKING WATER

Drinking water should be available for every pupil at any time of day which does not interfere with the school program.

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2. The following arrangement for ventilating flue is required in one western state: A circular sheet steel smoke flue, passing up in center of ventilating shaft (foul air exit) 20 inches square in the clear.

3. Sweeping compounds in moist proof containers may be obtained in the market.

Every rural school should have a sanitary drinking fountain located just inside or outside the schoolhouse entrance.

Drinking water should come from a safe source. Its purity should be certified by an examination by the State Board of Health or by some other equally reliable authority.

A common drinking cup is always dangerous and should never be tolerated.

Individual drinking cups are theoretically and in some conditions all right, but practical experience has proved that in schools, individual cups, to be used more than once, are unsatisfactory and unhygienic. Therefore, they are not to be advocated nor approved for any school.

Sufficient pressure for running water for drinking fountain or other uses in the rural school may always be provided from any source without excessive expense by a storage tank or by pressure tank with force pump.

VII. WATER FOR WASHING

Children in all schools should have facilities for washing hands available at least:

(a) Always after the use of the toilet.

(b) Always before eating.

(c) Frequently after playing outdoors, writing on blackboard or doing other forms of handwork connected with the school.

Individual clean towels should always be used.

Paper towels are the cheapest and most practicable.

The common towel is as dangerous to health as the common drinking cup.

VIII. FURNITURE

School seats and desks should be hygienic in type and adjusted at least twice a year to the size and needs of growing children. Seats and desks should be individual—separate—adjustable—clean.

Books and other materials of instruction should not only be sanitary but attractive enough to stimulate a wholesome response from the pupils.

IX. TOILETS AND PRIVIES

Toilets and privies should be sanitary in location, construction and in maintenance.

(a) If water carriage system for sewage is available, separate toilets for boys and girls should be located in the schoolhouse with separate entrances on different sides or corners of the school building.

(b) If there is no water carriage system, separate privies should be located at least 50 feet in the different directions from the schoolhouse, with the entrances well screened.

(c) The privy should be rainproof, well ventilated and one of the following types:

1. Dry earth closet.
2. Septic tank container.
3. With a water-tight vault or box.

All containers of excreta should be water-tight, thoroughly screened against insects and easily cleaned at frequent intervals.

No cesspool should be used unless it is water-tight and easily emptied and cleaned.

All excreta should be either burned, buried, treated by subsoil drainage, reduced by septic tank treatment or properly distributed on tilled land as fertilizer.

X. ALL SCHOOLHOUSES AND PRIVIES SHOULD BE THOROUGHLY AND EFFECTIVELY SCREENED AGAINST FLIES AND MOSQUITOES

XI. SCHOOLHOUSES AND OUTHOUSES SHOULD BE ABSOLUTELY FREE FROM ALL DEFACING AND OBSCENE MARKS

XII. BUILDINGS SHOULD BE KEPT IN GOOD REPAIR AND WITH WHOLE WINDOWS

CHILDREN IN COUNTRY SCHOOLS LESS HEALTHY THAN THOSE IN CITY SCHOOLS

From what we said last month about the lower death rate in the city as compared to the country and from the deplorable sanitation in the rural schools, one might anticipate the conclusion that children in rural schools are less healthy and have more physical defects than children in city schools. This indeed is justified by statistics. Dr. Thomas D. Wood, who has investigated the whole matter quite thoroughly, says that the same thing is true in general of all parts of the United States.

The reasons for the physical inferiority of the country child as compared with the city child are not difficult to determine. First of all the tide of human emigration toward the city during the last half century has carried some of the best human stock from the country to the city. Artificial selection has been detrimental to the country. A second reason for this inferiority is that the "science and art of human living, of conserving and improving human health and general human welfare have advanced much more rapidly in the cities than in the country districts." In the city the problems of safety and comfort have been serious problems to city dwellers and have challenged their attention. The average farmer usually brings up everything on the farm more carefully and more successfully than his own children. The last reason for this astonishing inferiority of the country child, according to Dr. Wood, is the environment. "The farmer's home," he says, "is, as a rule, insanitary in many respects. It is often unventilated and the dwellers in the house are fed many hours a day with bad air. Country water and food are less wholesome than water and food in the city. The standards of living on the American farm, when tested by the accepted principles of sanitation and hygiene, are alarmingly defective." Dr. Wood's observations on the rural school buildings are couched in unmistakable language. "The rural school, from the standpoint of health and general fitness for its important use," he says, "is the worst type of building in the whole country, including not only all types of buildings used for human beings but also those used for live stock and all domestic animals. Rural schools are, on the average, less adequate for their use than prisons, asylums, almshouses, stables, dairy-barns, pigeon-chicken-houses or dog-kennels are for their uses."

It is quite improbable that anybody who is personally familiar with the rural schools of this country will differ from Dr. Wood's conclusions.

THE RIGHTS OF THE COUNTRY CHILD

About 12,000,000, or three-fifths of the school children in the United States, attend the rural schools. These children are entitled to the same privileges of beautiful, sanitary school buildings as the children in the city. They have just as much right to be healthy and happy. It is a question in which not merely the country but the whole nation is involved, for the welfare of the entire nation is dependent upon the efficiency of the farmers, and also upon the splendid leadership which has been contributed to the city by the country.

HEALTH WORK IN CITY AND RURAL SCHOOLS COMPARED

If the country is ever to realize her health resources she must begin a systematic and purposeful campaign to improve and conserve the health of her public school children. In organized health administration and supervision the country has done almost nothing while the city has taken the lead to advantage. The backwardness of the country in health work is shown by the following table prepared by the joint committee of health problems in education of the National Educational Association and of the American Medical Association:

HEALTH WORK IN CITY AND RURAL SCHOOLS OF THE UNITED STATES

Activity	*For City Children*	*For Country Children*
Medical inspection laws in 23 states.	Mandatory for cities only, in 12 states.	Mandatory for rural schools in 7 states.
Mandatory laws.	Apply to all cities.	In 7 states.
Permissive laws.	Enforced in most cities.	In 6 of the 13 states having such laws.
Medical inspection practiced.	In over 400 cities.	In 13 states, in parts of 130 counties.
Dental inspection by dentists.	In 69 cities.	Permitted in 2 states, but not yet provided.
Dental clinics.	In 50 cities.	In one rural county, (St. John's County, Florida).
Clinics for eye, nose, throat and other defects.	In cities only.	None.
Nurses.	750 in 135 cities.	12 in 20 rural districts.
Open air classes.	In cities only.	
Athletics and recreation organized with appropriate facilities and equipment.	Practically all cities and large towns.	Little provision in rural schools.
Warm lunches in schools.	In over 90 cities in 21 states.	In a few scattered schools in 9 states.

THE TEACHING OF HYGIENE IN THE RURAL SCHOOLS

The general backwardness of the rural districts in matters pertaining to health also extends to instruction and training in hygiene in the rural schools. The teaching of hygiene in city schools, as the author has pointed out elsewhere, has been far from praiseworthy, but the probability is that it is far more practical than it is in the rural schools. Dr. Cubberly in "Rural Life and Education" writes thus of the teaching of hygiene in the country schools: "We have been teaching physiology for nearly half a century in our schools, yet of how little practical use it has been to us. . . . We have learned the names and the number of our bones, the pairs of muscles and nerves, and the anatomical construction of our different organs, but of practical hygiene we have learned but little. Our teachers are not taught such practical hygiene, and know but little about it; the people themselves, as a mass, know but very little as to sanitary conditions, and only recently have we begun to direct our attention to the proper form of physiology instruction, but most of this new awakening is due to the state boards of health and to the newspapers instead of the school."

LOCAL BOARDS OF HEALTH IN THE COUNTRY PASSIVE

In all rural districts there are local boards of health. Frequently they are elected by the people, but it is seldom, except in the case of some epidemic, that the average citizen in a rural community could even give you the name of the health officers, much less define their duties. Often these health officers are not even physicians. They may be without any special training and poorly paid. Then, too, the position is often regarded as a political stepping stone. Even physicians are likely to be inefficient as health officers because the pay is so inadequate or because they may injure their own practice by enforcing the health regulations. The country is greatly in need of trained health officers, well-paid and devoting their entire time to their work.

The reports of the state boards of health lament time and again the passivity and general inefficiency of the local boards of health. The following quotation from the report of the State Board of Health of Illinois is typical:

> Since White County is under township organization, each township has a board of health, created by State law and made up of the supervisor, assessor and town clerk. As a matter of fact, this board in White County, as in many other rural communities, may be regarded as a legal fiction. The country districts of the county really have no public health supervision, the only time that the board awakens to activity being upon the appearance of smallpox. Disinfection of premises after typhoid fever is unknown, and this is likewise true after cases of tuberculosis. General insanitary conditions of even the glaring sort are generally ignored.

BETTER LAWS ON SANITATION NEEDED

If the country is to progress in hygiene and sanitation it needs better laws providing for medical inspection of school children, school nurses, playgrounds, pure water supply, safe disposal of sewerage, etc.; but laws in themselves are meaningless unless supported by public opinion.

HEALTH EDUCATION MORE IMPORTANT THAN HEALTH LEGISLATION

Good laws are helpful if they are understood and enforced, but any law which excites the antagonism of a considerable number of citizens will not be effective. To get better sanitary legislation the people must be informed on matters pertaining to personal and public health; they must also have a desire to better conditions. When this time arrives we may expect that the best laws will be put on the statutes and that they will be enforced.

But health education is even more important than any amount of sanitary legislation; for whether people are to be healthy or not depends not so much on the passage of certain laws as upon the practice of the laws of personal hygiene—matters relatively independent of legislation. I refer to temperate eating, breathing fresh air, exercise, sleep, bathing, correct posture, cheerfulness, etc. Putting into practise these important suggestions necessitates the proper training of our school children. For this we turn to the rural school expectantly.

THE TEACHER'S OPPORTUNITY AND DUTY

In this coming campaign of health education for which the rural districts have a crying need, boards of health, physicians, school officers, school superintendents, granges and clubs may render valuable aid, but the fundamental success of this movement depends on the one in the firing line—the rural school teacher. It will be desirable for her to coöperate with all the social forces in the community, and she must take the lead. If the next generation in the country is to be healthier than the present it will be largely because of the instruction and training of the children in health matters in the rural schools. As we have already observed, the natural opportunities for health in the country are superior to those in the city, but the people in the country are to a very large extent unconscious of these possibilities. The teacher must point these out, and see that some control is gained over them. This is no easy matter, for the ordinary teacher in the rural schools is confronted by insanitary schoolhouses and schoolgrounds, inferior textbooks and an ultra-conservative public attitude. The teacher needs to have the conviction that health is far more important than instruction in any other subject and that the country is more in need of it than the city. She needs to approach her problems with some of the spirit of the missionary—enthusiasm, training, intelligence, tact and courage to help blaze the trail. Here is the opportunity and duty of the teacher.

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RURAL HEALTH AN EDUCATIONAL PROBLEM

BY LOUIS W. RAPEER

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Broad acres covered with the wealth of a prosperous country, bursting barns, good roads, automobiles for traction and for pleasure, good markets, commodious houses and good schools make up much of the tangible wealth of the rural community. But all these external forms are valueless if they are not transmuted or utilized for that immensely greater wealth of life itself. "Health is the first wealth," said Emerson, and by this he means that health is the foundation of personality, happiness and good living, without which the usual economic wealth for which so many slave and sacrifice is either valueless or a source of further misery. If country people are to put first things first, they must be taught a sense of relative values; and the special instrument created for this purpose by the government of the country people themselves is the public school. The principal problems of life set the problems of education and one of the leading problems of life, largely unmet at present by any agency, is the prime problem of health.

"But country people live a healthful life out-of-doors; therefore they are in good health. They know as much as is necessary to keep themselves healthy and vigorous. What more do you want?" some one may ask. Let us meet this question directly right here. Perhaps we shall find that rural-school hygiene will not be necessary and that teachers have no health responsibilities even though they are government officials dedicated to the whole welfare of the whole people.

Before we engage in such a study of the rural-health problem let us get clearly before our minds the general aims and purposes of rural education today in our democracy. Then we can tell whether health and physical well-being are legitimate aims of public rural education and how this aim compares with other aims. Individual and social happiness on as high and scientific a plane as possible is usually regarded as the goal of life by the ablest statesman. "The highest type of life dictated by our reason" is another statement of the goal. Self-realization and achievement are other statements of the same general aim of life. "Life more abundant" is the aim given by Christ. "Complete living," and "living as a fine art" are other expressions of the same ideas. The means to such general well being and life more abundant for all in the world commonly goes by the name of "social efficiency." For a simple and easily understood term for the general aim of life and of the institutions developed to minister to this life, then, social efficiency does very well. It takes in both the individual and society. It is today commonly accepted as the aim of education.

This general aim can be analyzed into its elements, and must be to give us much help in devising ways and means to achieve it. The guidance of life cannot be entrusted to statesmen or teachers who are without guiding stars. We must steer toward something. In his great essay on "What Knowledge is of Most Worth," Herbert Spencer years ago made an excellent analysis of this general aim. Others have followed in his footsteps. The principal factors of this general aim of social efficiency commonly accepted more or less definitely are as follows:

1. Vital efficiency, health and sound physical development.
2. Vocational efficiency: industrial, agricultural, commercial, professional, and domestic.
3. Civic efficiency, citizenship.
4. Moral efficiency, morality and true religion, including social service.
5. Avocational efficiency, the right use of leisure.

These five great aims are coming today to be commonly accepted as the principal aims of education, and the widespread and thorough reorganization of elementary, secondary, and higher education in city and country, based on accurate surveys and intensive investigations, is coming about directly by the application of these aims. For example, the survey of the schools of San Antonio, Texas, in 1915 was directed toward finding out how well the schools of that city were meeting practically the same list of aims as set forth in the above list. Many other city, county, state, and single-school surveys are today transforming education to meet these needs and problems of life even more effectively than the church, the government, business, the home, and other social institutions are being readjusted to meet them.

Most of the above institutions meet partial phases of the general aim, not all. The church is interested in promoting moral and religious efficiency, business in promoting vocational efficiency, etc. But the school as a public, supplemental educational agency must, through the child population, help to meet them all. The problems of life set the problems of education and the public, governmental schools with their state sanction and support, their compulsory and universal attendance during certain age periods, have for their function the preparation of the young *through* right living *for* right living. As a supplemental agency, the school must gradually change, as the conditions and problems of life change, to help society, through the young, to meet the problems met, or poorly met, by other institutions. As the apprenticeship and home systems of vocational education die out, for example, the school must take it up or society will be vocationally inefficient. When the moral influence of the church and home wanes, the school must strengthen society along these lines. If it unfortunately becomes imperative for our nation to be ready at any moment to meet by armed force a foreign foe the school must help in military preparedness, just as it has been attempting to meet the problem of an internal foe, the demon alcohol, in the same manner. There is hardly a problem of life of any serious importance to which the school cannot and should not, as a governmental agency dedicated to the public welfare, contribute through properly directed education. The present remarkable enlargement of the school's functions and, consequently, of the dignity and social importance of public-school teachers as makers of the State, are striking evidence of the truth of this principle.

Now one of the principal problems of life, as our evidence below indicates, is the problem of health and normal physical development. This is the fundamental prerequisite of individual and social happiness and of social efficiency. If all persons inherited good bodily constitutions of perfect Greek proportions and could go through life in spite of the vicissitudes of environment and the omnipresence of disease bacilli what rare and wonderful lives we might live! There would be no health or physical-education problems at schools, at homes, or anywhere else, no boards of health, no medical inspection, no physical-training exercises, no doctor's bills, except for the final hours at a ripe old age, and not the constant presence of death, disease, physical defects, and human misery and inefficiency caused thereby.

But inheritance and environment are not so kind to us. We are far from being physically perfect for meeting the conditions of our lives. About one-sixth of all persons born in the United States die before they are a year old. This astounding infant mortality is due almost entirely to preventable ignorance. About one-fourth of the persons born each year fail to reach the age of the kindergarten or first-grade child. Almost one-half are dead before the age of thirty-five. Nearly two million people die each year in this country; and the most accurate estimates of preventability show that not far from forty to fifty per cent of such deaths are reasonably preventable by the application of now known methods of disease prevention. Each year adds to our power over the grim monsters of death and each year sees the science of disease prevention pushed farther and farther ahead of the masses of the people. Education, which is the chief means for combatting death and disease according to universal experience and testimony, is far behind the science of preventive medicine, in many places as far as thirty to fifty years. Common practice is still farther behind. In many places we find baneful superstitions operating that are at least two thousand years old.*

Tuberculosis and typhoid are two of the principal causes of death in city and country. According to the best estimates as given in Fisher's volume on *National Vitality,* the first is seventy-five per cent preventable and the second eighty-five per cent preventable. And yet country people go on infecting and reinfecting each other and the people of the cities (through milk, water, personal contact, etc.) and do not learn at home, at church, or at school how readily and easily to prevent these needless deaths. On many tombstones in the church yards we yet find slanders on the Maker in epitaphs telling that "God in His infinite wisdom has taken these loved ones from our midst." We cannot permit such misstatements today. Were we to express the real truth, as they did for persons committing certain offences in earlier days, we should frequently have to say, for example, "Father and Mother So-and-So, in their infinite ignorance of the laws of health, criminally and wilfully exposed their small and delicate children to measles, in order that they might 'get it and get over it.' " The public school would be required to wear over its door the legend, or black letter, signifying, "This public agency supported by and dedicated to the welfare and happiness of the people failed to transmit that knowledge, those habits, ideals and appreciations

*A recent scientific collection of "Pennsylvania-German Folk Lore and Superstitions" by Fogel gives hundreds of health superstitions and "pow wows" over sick persons which have not yet died out. Such collections might be made in many parts of our progressive country.

relating to health which would guard people from making such calamitous blunders as 'So-and-So' have just made."

The cure for misdirected and wasteful education is knowledge of community and general social problems. The teacher must know both the health problems of the community and the nation and the individual child's health condition and needs. Elsewhere the writer has attempted to set forth briefly for teachers the general health problem of the nation and of the schools. Here our problem is that of rural and village health. Some questions which naturally confront us in this field of preventive medicine and preventive education are the following:

1. In what principal ways are bad-health conditions manifest in my community or nation?
2. What are the principal causes of death in my community and the nation at large?
3. To what degree are these deaths preventable?
4. What are the means of such prevention?
5. What are the principal kinds of illness and disease in the community and nation?
6. How preventable are they, whether causing death or not?
7. What are the means of prevention?
8. How common and of what kinds are the various physical defects and minor ailments?
9. How are they best to be prevented, cured, or corrected?
10. What diseases, minor ailments, and physical defects most commonly afflict the children of school age?
11. What are the losses in wages, in doctor's and funeral bills, in public-health care of the sick, and in decreased productivity due to ill-health?
12. How do rural regions compare with urban as to these facts?
13. To what extent have any community, states, or nations decreased their death rates, illnesses, and physical defects by preventive hygiene and curative medicines?
14. What are the most susceptible years for various diseases and defects?

Many volumes would be required to set forth the facts we now possess in answering the above questions. Even then our local and national bookkeeping of death and disease is very meager and inaccurate. All the states do not yet even require registration or reporting of deaths and their causes to some central authority, and the others have been keeping such records so short a time that we really know little about actual life-and-death facts in this country. In this we are far behind the leading countries of Europe from which we must borrow some of the leading facts and principles of death and disease. But to take in a few pages the data which we have and to get from them some accurate and scientific knowledge of community and health problems is far preferable to volumes of vague theories. Just as we have abandoned the old time-killing, deadening, and wasteful methods of teaching children almost at random any words out of the dictionary and geography which we could find, especially the difficult and never-used ones, frequently to the number of twenty thousand, and have by scientific methods today discovered the thousand words most used by people in their correspondence, which we emphasize as minimum essentials in improved methods of teaching,

so let us gain a knowledge of the minimum essentials of school-health promotion by a study of facts instead of unrelated pedagogical theory.

Teachers should, of course, be able to answer all the above questions from any general basic study of hygiene such as should be required of all upper-grade, high-school and college students. Rural teachers would need, beyond this, the elements of rural hygiene as related to the school, as city teachers need a knowledge of city-school hygiene. The great and beneficent science of rural hygiene might well be inserted between the general and the school hygiene courses for rural teachers. They would then know *general* hygiene (not so much anatomy and physiology, the "dry-bones" of the subject); they would know *rural* hygiene and the general health and sanitation problems of country life;* and they would have knowledge of how to take these two sciences and apply them to the problems of rural-school hygiene.

*See, for example, Gerhard's "Sanitation... of Country Houses," D. Van Nostrand Co., New York.

THE SCHOOL CLINIC

By Lawrence Augustus Averill

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In the early days of school medical inspection one of the most baffling problems which the authorities faced was how to induce the home to take the necessary steps to procure for its children the medical treatment of which the routine inspection showed them to be in need. It was the experience of nearly all cities which had adopted a system of medical inspection for their public school children that considerably less than 10% of their postal-card notifications ever succeeded in arousing the parents to a realization of their responsibility in the conservation of their children's health. Casting about, therefore, for some efficient means to induce them to act, the workers in this field came first upon the idea of the school nurse, a part of whose routine duties should be the persistent following up of all cases of deficiency until the needed corrective action was taken by the home. Under a well organized system of school nursing, as it has developed within the past decade, the percentage referred to above has been quite reversed, so that we find today some 90% of all defects which school medical inspection has revealed in a given city receiving speedy diagnosis and treatment by physicians, by dentists, by oculists, or by other specialists to whom parents at the insistence of the nurse bring their children. It is not always an easy matter, it is true, to induce parents to do their duty, and an endless amount of tact, persuasion and perseverance must often be employed by the nurse—but the significant thing is that the action is taken and with the inevitable good results.

There remains, however, some 10% of the deficient children who stand in just as vital need of skillful treatment as do the more fortunate 90%. These children come from homes of poverty and often of ignorance and

squalor where there are certainly not the means nor always the inclination to improve the physical condition of the children. Naturally, it is in just such homes as this that disturbances such as anæmia, glandular enlargements, tubercular tendencies, discharging ears, malnutrition, enlarged tonsils or adenoids and carious teeth are likely to be rife, and hence it is that, having discovered a means of disposing of such defects as were found among the middle-class and upper-class children, the authorities found it necessary to cast about once more to discover a means of securing corrective action in the case of the ailing children of less fortunate surroundings and less intelligent and resourceful parents. To meet this there have been organized in many of our cities and larger towns various types of clinics where needy children may receive professional medical attention without cost, or upon payment of a nominal fee to cover the cost of registration. Parents do not usually need much urging to take advantage of the opportunities offered by the clinic in the way of improving the health of their boys and girls. An added amount of coöperation is gained by the fact that parents are invariably invited to come to the clinic with their children and thus confer directly with the expert. Obviously the effect upon them is a far more salutary one than is produced by a mere postal-card notification or even the solicitation of the nurse.

The objection to such free clinics has often been advanced that not only is the medical profession in danger of violation but that the provision of free professional service for children of any class of parents points toward ultimate socialism. I cannot better meet this contention than by quoting from *Health Work in the Schools,* by Hoag and Terman (Houghton Mifflin Co., 1914):—

"The opposition comes chiefly from practising physicians, some of whom look with apprehension upon every social movement which seems to point toward an ultimate socialization of their profession. The issue, however, becomes clear if we only remember that disease is to be conceived as an evil to be eradicated, not as a resource to be conserved for the benefit of any profession. Partly by his own fault, and partly for social and economic reasons, the family doctor has failed to keep the people well. The family doctor institution need not be abolished, but it must be supplemented. What it has not done at all, or what it has done only with huge waste of effort, presents a legitimate field for organized social endeavors..."

Looked at from this point of view, the provision of free clinical treatment for children appears to become every whit as much the duty of the community as is that of providing free books or other educational facilities to the end that a better generation may result.

The writer in order to ascertain, among other things, the exact status of the school clinic idea in the leading cities of the country, has recently made a survey of public school health work in the 100 largest cities of the United States. The following questionnaire was sent out, under date of November 1, 1916, to the department of education in each of these cities:—

I. What is the school enrollment in your city?

II. How many school physicians? What is their approximate compensation?

III. Are there any school nurses? How many? Their compensation?

IV. *Are there school clinics, such for example as (1) psychological, (2) dental, (3) eye, (4) ear, etc.? Are these free? Are they proving successful? How many children are benefited by them?*

V. Are there other movements in your city for the safeguarding of the health of the pupils in the public schools?

Questions numbered I, II and III and the responses which they elicited from the school officials in the 100 cities were discussed at some length in our February and March numbers *(q. v.)* The returns to questions IV and V will be summarized briefly in this article. The names of the cities to whose superintendents the questionnaire was sent follow:—

GROUP I.

(Including cities of 500,000 population or over.)

Baltimore
Boston
Chicago
Cleveland
Detroit
Philadelphia
Pittsburgh
St. Louis

GROUP II.

(Including cities of from 250,000 to 500.000 population.)

Indianapolis
Jersey City
Kansas City (Mo.)
Los Angeles
Louisville
Minneapolis
Newark
New Orleans
Portland (Ore.)
Providence
San Francisco
St. Paul
Seattle
Washington*

GROUP III.

(Including cities of from 100,000 to 250.000 population.)

Albany
Atlanta*
Bridgeport
Cambridge
Camden (N. J.)*
Fall River
Grand Rapids
Houston
Nashville
New Bedford
New Haven
Oakland
Paterson
Reading
Richmond
Rochester
Salt Lake City
San Antonio
Scranton*
Spokane
Syracuse
Toledo
Trenton
Worcester

GROUP IV.

(Including cities of from 50,000 to 100,000 population.)

Akron
Allentown
Altoona*
Atlantic City
Augusta (Ga.)
Bay City
Bayonne
Berkeley
Binghampton
Canton
Charleston (S. C.) *†
Chattanooga
Covington
Davenport
Des Moines*
Duluth
East St. Louis (Ill.) *†
Elizabeth (N. J.)
Fort Wayne*
Forth Worth *†
Harrisburg
Hoboken
Johnstown (Pa.)
Lancaster*
Lincoln
Little Rock
Manchester
Montgomery*
New Britain*
Norfolk
Oklahoma City*
Passaic*
Pawtucket
Portland (Me.) *†
Pueblo (Dist. No. 1)*
Rockford (Ill.)
Sacramento*†
Saginaw (East)
San Diego
Savannah
Schenectady
Sioux City
South Bend
Springfield (O.)
St. Joseph (Mo.)
Terre Haute*
Topeka
Troy
Utica
Waterbury*
Wilkes-Barre*
York (Pa.)*
Youngstown (O.)*

*The 23 cities marked with the asterisk (*) maintain no clinics of any sort.
(*†) indicates that the city designated has neither school clinic, inspecting physician nor school nurse.

Among the facts established by the survey concerning the status of the school clinic in our larger cities are the following three:—

I. 77 of the 100 cities, or slightly more than 75%, maintain one or more clinics which offer free diagnosis and often treatment for the children of indigent parents. In the aggregate, the clinics in these 77 cities total 176, although 32 of them have only one each.

II. The most common type of clinic found is the dental, 59 of the 77 cities being thus provided. This is as it should be, since it is a fact well established by our medical inspection statistics that dental defects are by far the most common irregularities among school children. The character of the clinics follows:—

Dental	Eye	Ear	Psychological	General
59	28	20	16	14

Nose and Throat	Orthopedic	Tuberculosis	Unclassified
8	4	3	24

Total, 176.

III. The great majority of these clinics are maintained by various local philanthropic organizations, such as the District Nursing Association or the Parent-Teachers' Association. In many cities the hospitals provide the needed equipment, while public-spirited physicians, dentists, oculists, et al. give their time and services freely. In isolated instances manufacturing establishments maintain clinical facilities for the children of their employees. Very frequently private philanthropy donates buildings, equipment and the necessary funds for the work. The famous Forsyth Dental Infirmary in Boston typifies well this last mentioned class of clinic. In only 22 of the 77 cities are there clinics maintained specifically as *school* clinics under the immediate direction of either the board of health or the department of education.

I quote briefly from some of the more interesting reports received:—

BALTIMORE. We have a special class for the observation and study of sub-normal children. This class has the benefit of the oversight of the Henry Phipps Psychiatric Clinic of the Johns Hopkins Hospital. We have free dental clinics for the children of parents who cannot afford to pay a dentist. In addition to dental treatment, the children are given lessons on the care of the teeth and are provided with dental washes... The clinic in school No. 9 has been in operation for four years; approximately 300 children have been treated during that time. A clinic was in operation at School No. 112 (colored) for one year. During this time 1195 children were examined and treated...

NEWARK. In the Deartment of Medical Inspection Building is located the Public School Clinic, having the following departments: eye; ear; nose and throat; orthopedic; general medical; dental; psycho-neuropathic. All clinics are free, but glasses are supplied at $1.50 each to those who are able to pay for them. To pupils unable to pay, they are furnished free and the optician is reimbursed by the Board of Education. The Clinic has so far proved a great success, having treated in all 5,690 new cases and had a total of both old and new of 10,052 cases.

MANCHESTER. The medical inspection of our school children is under the control of the Board of Health, thus obviating the necessity for two systems of inspection to provide for the public and the parochial schools, the latter type in Manchester having an enrollment greater than the public schools, including high schools. In a city like Manchester, with large foreign elements, big families and average wages (December, 1916) $12. to $14. per week, clinics are absolutely indispensable. Although I regret that we have not complete records of treatments, I submit the following report for the school year 1915-1916 which was given me by a school nurse having the wealthiest section of the city under her charge:—

CHILDREN RECEIVING DENTAL TREATMENT

School	Enrollment	By Family Dentist	At the Amoskeag Clinic	At the District Association Clinic	
A	280	180	10	3	best section
B	341	125	17	7	best section
C	312	84	10	10	good section
D	321	79	14	16	fair section
E	171	18	28	28	poor section
F	94	34	15	8	fair section
G	23	0	0	0	good section

Trenton. The special staff in charge of the examination of mental defectives consists of an expert psychologist, the school physician and a special nurse. We are also fortunate in having a State Hospital for the Insane in the suburbs of the city, and Princeton University nearby and we have therefore had the coöperation of expert alienists, professors and graduate students in conducting our examinations and tests of mentally defective pupils. The dentists of the city maintain a free dental dispensary in the city hall. For the eye and the ear we usually send pupils to city hospitals. Of course we make all the necessary preliminary tests of vision through our medical inspectors and nurses.

It is significant that only 6 cities in *Groups I, II and III* combined fail to maintain school clinics, while 19 of the smaller cities in *Group IV* have no such facilities. Were our inquiry to extend still further downward among the towns and cities having a population under 50,000, it is probable that the status of the clinic would be correspondingly lower; in the country districts this branch of school health work would, of course, be found to be as yet generally unorganized. Notwithstanding, the need is probably about equal among all school children, whether they live in large cities or in smaller towns.

A few conclusions and recommendations will not be out of place here:—

I. Every city, town and rural county (or other rural unit) numbers among the pupils enrolled in its public schools a small proportion of children who are in need of expert medical or dental treatment and whose parents are unable to procure the same for them. It appears therefore to be the duty of the school authorities in every town to make it possible for such children to receive professional attention without fees. In the larger towns, and in greater measure in the cities, free clinics of various sorts meet this need excellently, and are to be recommended in ever increasing numbers and universally. The smaller towns may find it more economical and just as satisfactory to refer the deficient children of indigent parents to local physicians and to pay regular office rates.

II. The typical clinic at the present time is supported entirely or in large measure by public philanthropy, by charitable institutions, or by local social organizations, and is administered by public spirited experts, who give their services without remuneration. Organization of clinical work on this basis cannot, however, be deemed to be permanent. Ultimately, as is already the case in a few cities, the clinic will be recognized as a *bona fide* adjunct to educational work, and will therefore be supported at common expense and officered by professional men who receive adequate salaries for services rendered. Only thus can it hope to be an efficient agency in caring for the less fortunate children. It will be a *school* clinic, not a *charity* clinic.

III. The school clinic of the future will not content itself with mere diagnosis; it will aim not only to analyze but to synthesize, to correct defects and deformities; it will be positive and constructive.

IV. In the interest of economy of time, effort and expense it would seem wise to bring all the clinics of a given city under one roof, as Newark, for example, has done. In the smaller cities, two or three rooms in the city hall or in one of the larger school buildings will serve the purpose well enough, but for moderate and larger sized cities a department of medical inspection building will be found ultimately to be indispensable for the efficient administration of local school health work.

Meantime, however, most of our cities are fortunate in possessing numerous philanthropic institutions and societies which are carrying on an excellent work. Necessarily under such organization of educational hygiene, however, there is much duplication of effort which can only be eliminated by the ultimate adoption of some such central clinic as we are here suggesting. The personnel of the city school clinic will then naturally include preëminently the school physicians, dentists and nurses, whose salaries will be made commensurate with the labors expected of them.

NOTES AND DISCUSSIONS

The Tenth Congress of *The American School Hygiene Association* will meet at Albany, N. Y., June 7, 8 and 9.

The Board of Education for New York City has recently passed a By-law to the effect that all teachers holding No. 1 Licenses may be qualified for licenses as substitute teachers of Physical Training in the High Schools, if they have received 90 hours' instruction in Physical Training.

Owing to the passage of the Welsh Law, which demands the appointment of Physical Training Teachers, it is estimated that there will be a great demand for teachers of this subject for the high schools of New York City and New York State. In all probability only a small proportion of these will be available. Substitutes will be paid $4.00 per day, and will be sought in large numbers. In fact, efficiency in Physical Training has become so important a part of education that the State of New York offers to pay one-half the salary of the Physical Training teacher up to $600.

New York University appreciates the great need for these teachers, not only in New York City and State but throughout the United States as well. It offers a series of practical and theoretical summer courses, which exactly meet the requirements of new Welsh Law. These courses will be delivered under the personal supervision of Dr. C. Ward Crampton, Director of Physical Training of New York University, who will be assisted by Dr. I. H. Goldberger, Assistant Director of Educational Hygiene, New York City Schools; Miss Louise Baylis, Instructor of Physical Training and Dancing, Erasmus Hall High School, Brooklyn, N. Y; Michael A. Jones, Instructor of Athletics, Public School Athletic League; Wm. J. Lee, Supervisor of Parks and Playgrounds, Dep't. of Parks, New York; John J. McHugh, Inspector of Athletics, Public School Athletic League; Rowland A. Patterson, Inspector of Athletics, Public School Athletic League; Miss Adela J. Smith, Special Teacher for Physically Handicapped Children, New York City Schools, and others.

The Course will be delivered at Washington Irving High School, 17th Street and Irving Place, New York. This building is recognized as the best equipped high school for girls in the world. All the facilities of this splendidly equipped plant will be at the disposal of the students—the lecture rooms, rest rooms, library, gymnasiums, shower baths and roof playgrounds. For complete information regarding the course our readers are referred to Dr. C. Ward Crampton, Director of Physical Training, 157 East 67th Street, New York City, N. Y.

The first number of *Mental Hygiene,* a quarterly journal devoted to the conservation of mental health, appeared in January. It is the official organ of the *National Committee for Mental Hygiene,* New York City, and as such merits the support and approbation it is bound to receive at the hands of all who are interested (and who is not?) in the work of mental conservation and practical mental hygiene. A special article by C. Macfie Campbell, entitled: The Sub-normal Child—A Study of the Children in a Baltimore School District, appears in the first number.

The sum of twenty-five thousand dollars annually hereafter has just been appropriated by the legislature of Iowa to finance child welfare research at the Iowa State University. Arrangements are now being made to begin work July 1. This fund came to the University as the result of a demand made by club women of the state for more work for child betterment. In their campaign they profitted by the excellent advice of Dean C. E. Seashore, head of the University's department of psychology.

The work to be done by this institution will be unique in that it will be the first important undertaking, in any way other than by education, of a state to finance without restriction scientific effort toward betterment of the condition of the normal child. Millions of dollars have been spent by the state for defectives but heretofore practically nothing for the child who is well.

Dean Seashore, who has been made chairman of the University Committee on Research in Child Welfare, has prepared a very suggestive bulletin (New Series No. 107, January 15, 1916) entitled *A Child Welfare Research Station,* in which the general plans and possibilities of such a station are outlined. Copies of this excellent pamphlet may be obtained upon request from the Librarian of the University, Iowa City.

To quote a single paragraph from the bulletin:—

Child-study which is revealing the wonders in the nature of the child mind, has naturally led to the present movement which can be called child-adjustment. This arouses in the minds of some people the idea that we are trying to get an artificial system. But the case is just the contrary. Child-adjustment demands that our customs, our rules, our ideas of child life shall be so improved that nature may have its freest sway for the development of the child to its fullest possibilities. For, just as the physician does not cure but merely disinfects and helps to obtain those conditions which are favorable to nature's cure; so mental development is not something that we can put into the mind of the child. We can only favor it by ruling out those conditions which interfere with nature's beneficent ways.

Recent contributions to other educational periodicals by the editors of this JOURNAL include the following:—

By Dr. Averill: *Child Psychology in the Normal School,* in *Education* for April.

By Dr. Burnham: *The Optimum Temperature for Mental Work,* in the *Pedagogical Seminary* for March.

A Health Examination at School Entrance, in the Publications of the Massachusetts Society for Mental Hygiene.

By Dr. Rapeer: *Minimal Essentials of Physical Education and a Scale for Measuring Results of Physical Education.* In the 16th *Yearbook* of the National Society for the Study of Education.

A Core Curriculum for High Schools, in *School and Society,* May 5, 1917.

Standardizing the Rural Classroom in *The Educator Journal* for April.

The Classroom of Rural and Village Schools, in *School and Home Education* for April.

By Dr. Terman: *A Trial of Mental and Pedagogical Tests in a Civil Service Examination for Policemen and Firemen* in *The Journal of Applied Psychology* for March.

The JOURNAL announces the appointment of Professor Louis W. Rapeer as Dean of the University of Porto Rico, at Rio Piedras, P. R. The Chancellor of the University is also Commissioner of Education for the Island, so that a large share of the administration of the institution will devolve upon the Dean. Dr. Rapeer will continue to serve this JOURNAL in the capacity of contributing editor and we shall hope to publish other interesting articles from his pen from time to time.

Holiday courses in education will be conducted during the summer session at Columbia University by Dr. Lewis M. Terman, at New York University by Dr. C. Ward Crampton and at the University of Montana by Dr. Louis W. Rapeer.

RECENT LITERATURE

A HEALTH EXAMINATION AT SCHOOL ENTRANCE, by Professor William H. Burnham, Clark University, Worcester, Massachusetts. Publication No. 27 of the *Massachusetts Society for Mental Hygiene.* (Reprinted from the Journal of the American Medical Association, March 24, 1917, Vol. LXVIII, pp. 893-899) 28 pp.

A plea for a thorough-going examination of all pupils at school entrance. The scope of the examination, according to Dr. Burnham, should include (1) the determining of the physiological age of the child by means of Roentgenograms of epiphyseal development (after Rotch and Pryor), various indices such as the vital and the cardio-vascular, or by some other tests either already known or to be ultimately perfected; (2) the determining of the child's psychological age through the use of the Binet and other material; (3) notation of the condition of the child's general health as evidenced by the state of his teeth, throat, naso-pharynx, eyes, ears, etc.; and (4) recording the morbidity history of all diseases that the child has had. Such an examination as proposed is desirable:—

1. To prevent those children who are in ill health or not sufficiently developed physically and mentally from entering.

2. To provide the necessary physical data to enable teachers so to order the school work that it will not result in injury to health or a check to development, as often happens in the first year of school life.

3. That proper grading and adaptation of school occupations to individual capacity may begin at the outset of school life.

4. To give school physicians the data necessary for safeguarding the health of children against contagious diseases and the like.

5. To give teachers proper knowledge of the new pupils and the right attitude toward them.

6. That children may begin right and be saved from unnecessary failure and retardation or elimination in later grades.

7. To educate parents and foster a right attitude toward the school.

8. To save the money of tax payers, now largely wasted, and so badly needed to provide for absolutely essential hygienic conditions.

Says Dr. Burnham:—

If the hygienist could have his way, the first year of school life, or perhaps the first two years, would be a *Vorschule,* in which the teachers would be physicians and hygienists; and the aim for this year would be to determine the child's stage of development, his physical resources, his physical defects, etc., and as far as possible to remedy these defects and to foster normal development by ample opportunity for play and other forms of spontaneous motor activity. . . . . .

Our present haphazard method of taking in the sick and the well, the developed and the undeveloped, the normal and the feebleminded, the defective and the sound, and of teaching them together at the outset is wasteful and absurd. A grading with the knowledge that we now have would help to a great degree.

The movement for health inspection should be ardently advanced. A health examination at school entrance is the next important step. With the present dissatisfaction with the schools on the one hand, and the great interest in methods of efficiency on the other, the time is favorable for such an improvement. This would ultimately require some new legislation and some readjustment of school plans, but it would be merely carrying farther what is already done in some schools. If the plan were given a fair trial in some one city or state, I am confident that the advantages would be so great that soon the movement would spread.

Thus it is obvious that such a thoroughgoing examination of the physical and mental condition of the children would help in many ways. It would help greatly in the diagnosis of doubtful cases. It would save the expense of a large number of repeaters. It would lighten the burdens of the teachers. It would develop right attitudes in parents, and in many cases save the anguish of discovering later that children are feebleminded or defective. It would be only reasonable justice to the children themselves. It would in some cases save those who are candidates for mental disorder. In a word, such an examination would be distinctly important for mental as well as somatic hygiene.

HEALTH AS A MEANS TO HAPPINESS, EFFICIENCY AND SERVICE, by Dr. Louis W. Rapeer. Reprinted from *The Annals* of the American Academy of Political and Social Science for September, 1916. Publication No. 1060. 10 pp.

An excellent general discussion of our health problem, having special reference to educational hygiene and the school child.

STANDARDIZING LIGHTING AND VENTILATION IN PUBLIC SCHOOLS, by Dr. Louis W. Rapeer. Reprinted from the *Journal of Education*, Boston, for January. 8 pp.

A summary of recent investigations in ventilation which have resulted in exploding the old "carbon dioxide" and the "organic poisons" theories; also a semi-experimental and semi-free-lance discussion of the lighting of school rooms.

STATEWIDE PHYSICAL TRAINING, by Dr. Clinton P. McCord, Health Director of Public Schools, Albany, N. Y. A health editorial in the October number of *American Education*. Reprinted in *The Health Messenger*, the organ of the Albany Public Schools, Vol. II, No. 1. 8 pp.

A *résumé* of the military training program of New York State, drawn up in pursuance of the provisions of the Welsh-Slater Law establishing the State Military Training Commission.

THE OPTIMUM TEMPERATURE FOR MENTAL WORK, by Professor William H. Burnham, Clark University, Worcester, Massachusetts. In *The Pedagogical Seminary* for March, 1917. Vol. XXIV, pp. 53-71.

An eminently practical discussion of a very important phase of educational hygiene. Dr. Burnham emphasizes the fact that ventilation is not preëminently a matter of replenishing the supply of oxygen in a room, nor of eliminating the excess of carbon dioxide from it, nor yet of carrying away what was formerly supposed to be certain organic poisons resulting from expiration, but rather the problem of ventilation is one of *body ventilating*, that is of maintaining a certain optimum temperature and relative humidity under the influence of which brain activity, as conditioned by bodily comfort, is at its best. Numerous experiments are cited both in support of this fact and also by way of suggestion as to the actual temperature and humidity which make for the greatest economy of time and accuracy and for the least fatigue in mental work.

FREE MUNICIPAL CLINICS FOR SCHOOL CHILDREN. A review of the work of the school children's nose and throat clinics in New York City, by J. H. Berkowitz, Field Agent and Special Investigator, Bureau of Welfare of School Children, New York Association for Improving the Condition of the Poor.

In this pamphlet are contained 16 pages of very interesting reading on the work done by the clinics of a large city in the treatment of the common nasal and throat disorders of children.

COURSES OF STUDY IN HYGIENE AND SANITATION. Nebraska Educational Bulletin, December, 1916, Vol. II, No. 3. Prepared by Professor F. M. Gregg, State Normal School, Peru, Nebraska.

See Mr. Gregg's article in the April number of this JOURNAL on the teaching of hygiene for a detailed outline of these courses.

SANITARY SCHOOL SURVEYS AS A HEALTH PROTECTIVE MEASURE, by J. H. Berkowitz, Field Agent and Special Investigator, Bureau of Welfare of School Children, New York Association for Improving the Condition of the Poor.

A bulletin of 9 pages, with illustrations, summarizing the results of a recent survey of a large public school, having an enrollment of over 1,900 pupils, in one of the more congested sections of New York City. A plea is made for broader and more universal surveys of the sanitary conditions in our public schools.

SPECIAL CLASS SYSTEM. A 4-page leaflet on the subnormal child, by Dr. Clinton P. McCord, Health Director of the Albany Public Schools.

Expert examination of school children shows that about 2% are of such mental constitution that they can never profit by the work of the regular grades. These children, scattered through the regular classes, are either neglected or punished instead of being studied. They bring to us a part of the problem of truancy, incorrigibility and inability to learn or "get along," and are a tremendous drain upon the energies of the grade teacher. This type of child cannot be managed like other children, and therefore he requires special care and treatment under conditions suited to his abilities.

Acknowledgement is also made of the receipt of the following books:—

PERSONAL HYGIENE AND PHYSICAL TRAINING FOR WOMEN. Second edition, thoroughly revised. By Anna M. Galbraith, M. D., Fellow of the New York Academy of Medicine, etc. Philadelphia and London, W. B. Saunders Company, 1916. 393 pp.

THE FOUR EPOCHS OF WOMAN'S LIFE. Third edition, revised and enlarged. By the same author and publishers as the above. 1917. 296 pp.

The American Journal of School Hygiene

VOLUME I JUNE, 1917 NUMBER 6

THE TENTH CONGRESS OF THE AMERICAN SCHOOL HYGIENE ASSOCIATION

BY LAWRENCE AUGUSTUS AVERILL

Head of the Department of School Hygiene and Educational Psychology in the Massachusetts State Normal School, Worcester, Massachusetts

The Tenth Annual Congress of the American School Hygiene Association met in the State Education Building at Albany, New York, on Thursday, Friday and Saturday, June 7th, 8th and 9th. Each of the seven sessions had much to commend it, notwithstanding the fact that the attendance was very light, averaging probably less than 100; that several of the most attractive speakers advertised were unable to be present—notably Dr. Lewis M. Terman, Dr. H. H. Goddard, Dr. A. J. Chesley and Dr. Frank Allport; that exhibits were conspicuous by their fewness; that the discussions were surprisingly desultory; and finally that, instead of the program being national in its personnel, two-thirds of the speakers were New Yorkers—no less than 42 of a total of 62 participants hailing from that State. On the whole, however, the various themes chosen for deliberation were so timely and the speakers so capable of discussing them that members in attendance from extra-New York sections were rather enticed into following the deliberations of the Congress with much interest and profit.

The complete program* follows:—

OPENING SESSION

Thursday Morning, Nine-thirty o'clock
Auditorium, State College for Teachers

Congress assembled by
PRESIDENT LINNEAUS N. HINES

Greetings of the University of the State of New York:
HON. THOMAS E. FINEGAN,
Deputy Commissioner of Education, New York State

The Keys to Our City:
HON. JOSEPH W. STEVENS
Mayor, Albany

*All papers and discussions will be published at an early date in the annual Proceedings of the Association. Readers interested in securing copies should address Dr. William A. Howe, Secretary of The American School Hygiene Association, State Education Bldg., Albany, N. Y., who will be pleased to state terms.

SESSION ON SCHOOL NURSING

Chairman: MISS MARY E. LENT, R. N.
Associate Secretary National Organization Public Health Nursing, New York City

Vice-Chairman: MISS MAUD REEDER, R. N.,
Supervisor of School Hygiene, Dubuque, Iowa

Secretary: MISS C. JOSEPHINE DURKEE, R. N.,
Supervising Nurse, New York State Department of Health, Albany

Health Problems Among Rural School Children:
MILDRED B. CURTISS, R. N.,
Supervising School Nurse, Schenectady County, N. Y.

The School Clinic Recruiting Station for the Open Air School:
HENRIETTA KNORR, R. N.,
Superintendent of Nursing Division, Baltimore

Effective Methods of Teaching Hygiene to School Children:
KATHERINE OLMSTED, R. N.,
State Supervising Nurse, Wisconsin Anti-Tubercular Association, Milwaukee

Health Education, Its Place in the School Curriculum:
EDITH M. WALKER, R. N.,
Superintendent, Health Educational Dept., Binghampton, N. Y.

Possible Activities for the School Nurse in a Small City:
HELEN M. NEEDLES, R. N.,
Nurse, Newton Public Schools, Newton, Iowa

Health of the Child Before School Age:
DR. GRACE L. MEIGS,
In charge Division of Hygiene, Children's Bureau, Washington, D. C.

THURSDAY AFTERNOON SESSION

SYMPOSIUM

Part I

DEFECTS OF HEARING AND SPEECH

2:00-4:30 P. M.

Leader, HELEN HILL, M. A.,
Inspector, New York State Board of Charities

THE EDUCATION OF DEAF PUPILS:

Teaching Speech to the Deaf.

At the Institution for the Improved Instruction of the Deaf, Lexington Avenue, New York City.

a. Address by the Principal, HARRIS TAYLOR, LL. D.

b. Moving pictures showing institutional and school activities for the development of the pupils.

First Steps on the Road to Knowledge.

a. At the Albany Home School for the Deaf.
Demonstration with first year pupils:
MARY MCGUIRE, *Asst. Principal*

b. At LeCouteulx St. Mary's Institution for the Deaf, Buffalo.
Demonstration with third year pupils:
SISTER MARTINA, *Asst. Principal,* and SISTER RICARDO

Some Educational Features.

At the New York Institution for the Deaf, Fort Washington Avenue, New York City.

a. The Value of Musical Vibration to the Deaf:
ENOCH HENRY CURRIER, M. A., *Principal*

b. Breath and Voice Control; method of development illustrated with pupils:
AMELIA BERRY, B. A.

c. Military Training for the Deaf; presented by a squad of deaf cadets and the school band composed of deaf boys.

d. Class Instruction in Anatomy; illustrated with pupils:
IGNATIUS BJORLEE, M. A.

THE CONTROL OF ADVENTITIOUS DEAFNESS:

Advice of the otologist to the general medical practitioner, the parent and the school official.

Speaker: HAROLD M. HAYS, M. D., F. C. S.,
President, New York City League for the Hard of Hearing

PREVENTION AND CORRECTION OF SPEECH DEFECTS:

Presentation of hearing pupils with defective speech.

Speaker: FREDERICK MARTIN, Ph. D.,
Director of Speech Improvement, New York City Department of Education

Part II

ILLUSTRATED REPORT:

University extension work for the conservation of sight.

MRS. WINIFRED HATHAWAY,
Secretary, National Committee for the Prevention of Blindness

THE PUBLIC SCHOOL PUPIL WITH PARTIAL SIGHT:

What special classes may do to retain him as a public school pupil and to prevent blindness through eye strain.

MARION A. CAMPBELL,
Secretary, New York State Commission for the Blind

THURSDAY EVENING, Eight o'clock

NUTRITION OF THE SCHOOL CHILD

Mrs. Anna Hedges Talbot, Chairman
Specialist, Vocational Education for Girls, New York State Education Department

ILLUSTRATIONS OF NUTRITIONAL WORK IN PUBLIC SCHOOLS

Albany—CLINTON P. MCCORD, M. D.,
Health Director, Albany City Schools

Solvay—ROY P. KELLEY, *Superintendent of Schools, Solvay, N. Y.*

Vermont—MISS LESSIE MAE COBB,
State Education Department, Vermont

New York City—EDWARD F. BROWN,
Executive Secretary, New York School Lunch Committee

THE ESTABLISHMENT AND WORK OF THE FIRST NUTRITION CLINICS IN BOSTON FOR DELICATE CHILDREN:
WILLIAM R. P. EMERSON, M. D.,
Massachusetts General Hospital, Boston

THE CORRELATION OF MALNUTRITION AND DISEASES AMONG CHILDREN:
LOUISE STEVENS BRYANT, Ph. D.,
Department of Medical Science, University of Pennsylvania

AUTO INTOXICATION AN ETIOLOGICAL FACTOR OF NEUROSES OF CHILDREN:
DR. WILLIAM R. WOODBURY, Rochester, N. Y.

EVIL INFLUENCES OF STIMULANTS ON HEALTH OF THE SCHOOL CHILD

Alcohol—ELIZABETH HAMILTON-MUNCIE, M. D., Brooklyn, N. Y.

Tea and Coffee—WILLIAM J. BOOKS, M. D.,
Chief Medical Inspector of Schools, Schenectady, N. Y.

Tobacco—WILLIAM A. MCKEEVER, *University of Kansas, Lawrence*

FRIDAY MORNING, Nine-thirty o'clock

SCHOOL MEDICAL INSPECTION

Chairman: DR. GEORGE JENKINSON HOLMES,
Chief Medical Inspector of Schools, Newark, N. J.

Vice-Chairman: DR. MARY B. BEARD,
Medical Inspector of Schools, Evanston, Ill.

Secretary: DR. M. D. DICKINSON,
Chief Medical Inspector of Schools, Troy, N. Y.

FILM: Fresh Air Class Rooms in Philadelphia:
WALTER W. ROACH, M. D., Philadelphia

SYMPOSIUM: How can better results be obtained in securing correction of defects found among school children:

1. In Cities of the First Class:
DR. MORRIS L. OGAN, *Bureau of Child Hygiene, New York*

2. In Cities of the Second Class:
DR. CLINTON P. MCCORD, *Health Director City Schools, Albany*

3. In Cities of the Third Class:
DR. ESDALL D. B. ELLIOTT, *Medical Inspector of Schools, Glens Falls*

4. In Rural Communities:
MR. JAMES WINGATE, *District Superintendent Schools, Schenectady*

Experiences and Conclusions in School Medical Inspection:
DR. FLORENCE A. SHERMAN, *Medical Inspector of Schools, Bridgeport, Conn.*

Buffalo's Campaign for Open Air School Rooms:
DR. FRANCIS E. FRONCZAK, *Commissioner of Health, Buffalo*

The Relation of Tonsillar and Nasopharyngeal Infections to General Systemic Disorders:
DR. H. R. SLACK, JR., *Johns Hopkins Hospital, Baltimore*

Weak Arches Among School Children:
DR. CHARLTON WALLACE, New York

The System of School Medical Inspection in New York State:
DR. WILLIAM A. HOWE, *State Medical Inspector of Schools, Albany*

FRIDAY AFTERNOON, Two o'clock

SESSION ON PHYSICAL TRAINING

Auditorium, State College for Teachers

Chairman: THOMAS A. STOREY, *State Inspector of Physical Training*

Vice-Chairman: FREDERIC A. WOLL, *Assistant Professor of Hygiene, College of the City of New York*

Secretary: THOMAS C. STOWELL, *Secretary of the New York State Military Training Commission*

Physical Training in the Schools of the First District of Franklin County:
MYRTLE E. MACDONALD, *District Superintendent of Schools, Chateaugay, N. Y.*

Physical Training in the One-Room School:
BESSIE L. DARK, *Physical Director, State Normal and Training School, Cortland, N. Y.*

Physical Training in the Schools of the Schenectady District:
JAMES WINGATE, *District Superintendent of Schools, Schenectady, N. Y.*

A Summary of the Status of Physical Training in the Private Schools of the State:
GUERDON N. MESSER, *Assistant State Inspector of Physical Training, New York*

Physical Training in the Parochial Schools of the State of New York:
DANIEL J. KELLEY, *Assistant State Inspector of Physical Training.*

A Summary of the Operation of the State Program of Physical Training in the City of Rochester:
HERMAN J. NORTON, *Supervisor of Physical Education, Rochester, N. Y.*

The State Program of Physical Training in the Public Elementary and Secondary Schools of New York City:
WARD CRAMPTON, *Director of Physical Training, New York City*

The Organization of the Department of Hygiene in the College of the City of New York:
FREDERIC A. WOLL, *Assistant Professor of Hygiene, College of the City of New York*

Dental Hygiene in the College of the City of New York:
C. E. HANSON, D. D. S., *Instructor in Hygiene, College of the City of New York*

FRIDAY EVENING, Eight o'clock

COMMUNICABLE DISEASES AMONG SCHOOL CHILDREN

Chairman: DR. H. M. BRACKEN, *Executive Officer, Minnesota State Board of Health, St. Paul*

Vice-Chairman: DR. W. S. RANKIN, *Secretary, North Carolina State Board of Health*

Secretary: DR. F. M. MEADER, *Director, Division of Communicable Diseases, New York State Board of Health*

HEALTH FILM Samaritan Three

Tuberculosis Among School Children:
DR. HENRY CHADWICK, *State Sanitorium, Westfield, Mass.*

Trachoma:
DR. WILLIAM T. POWER, New York City

The Management of Outbreaks of Infectious Diseases Among School Children:
DR. A. J. CHESLEY, *Director, Division of Preventable Diseases, Minnesota State Department of Health*

Epidemiologist or Nurse—Which?
DR. W. F. KING, *Assistant Secretary of the State Board of Health, Indiana*

The Importance of Sore-Throat in Schools:
DR. MAURICE OSTHEIMER, Philadelphia, Pa.

HEALTH FILM: The Trump Card.

SATURDAY MORNING, Nine-thirty o'clock

GENERAL SESSION

Chairmen
DR. LEWIS M. TERMAN, *Leland Stanford University*
DR. H. J. BURKHART, *Rochester Dental Dispensary*
DR. FRANK ALLPORT, *Chicago*

The Possibilities of Mental Hygiene in Cases of Arrested Mental Development:
HENRY H. GODDARD, Ph. D., Vineland, N. J.

Fortifying the Child Against Mental Disorders:
EVERETT S. ELWOOD, *Secretary of New York State Hospital Commission*

Illustrated Lecture on Mouth Hygiene:
C. H. OAKMAN, D. D. S., M. D., Detroit

School Dental Certificate, Its Value and Importance:
THADDEUS P. HYATT, D. D. S., New York

Eye Strain in Relation to Brain Fatigue:
DR. ROYAL S. COPELAND, New York

Eye Strain in Children:
DR. EDWARD R. WILLIAMS, Boston

Retardation in Schools from Refractive Errors:
DR. WILLIAM M. CARHART, New York

Present Day Factors in the Schools of the Blind, as Emphasized at Perkins Institution:
DR. EDWARD E. ALLEN, Watertown

The following brief *résumé* is given of some of the interesting contributions of the several speakers:—

Dr. Henry Chadwick, of the State Sanitorium at Westfield, Massachusetts, declared it to be the conclusion from his experience that 90% of all children are infected with the *tubercle bacillus* at some time before reaching the age of 15, and that unquestionably a tubercular mother is the most dangerous member of the household from the point of view of possible infection of the child.

Dr. C. Ward Crampton, Director of Physical Education for the Department of Education of the City of New York, declared that the enactment of the Welsh-Slater Law was a landmark in the educational history of the State, and that school principals everywhere were enthusiastically preparing to put it into operation. In the New York City schools, under their present organization, it has been impossible to find the necessary amount of time to devote to this work, so that the school committee is likely to extend the school day one hour in length, beginning with the fall term, thus gaining the needed time for the required physical training program.

Dr. Everett S. Elwood, Secretary of the New York State Hospital Commission, stated that 10% of the insanity among the inmates of the New York State hospitals is due to alcoholism, 14% to syphilis and 20% to the *dementia præcox* of adolescence.

Dr. W. F. King, Assistant Secretary of the Indiana State Board of Health, recommended that, notwithstanding the recent remarkable growth of the school nurse idea, a very important and significant phase of school health work must needs be skilled knowledge of epidemiology, and consequently the full-time medical inspector remains an indispensable asset in the economy of educational hygiene.

The paper of Dr. William T. Powers, of New York City, on *trachoma*, together with the discussion that followed, would indicate that this dread eye infection is becoming less and less common in New York City, being usually found in a milder form than true trachoma ordinarily assumes. In the southern sections, however, particularly among the poorer classes in the mountain districts, true trachoma is still very commonly met with and causes annually an immense amount of suffering and economic waste.

A feature of the closing session was the appointment of a special national committee, of which Dr. C. H. Oakman, of Detroit, Michigan, was named chairman, to make a study of the possibilities of creating a more wide spread interest in the subject of dental hygiene, and to report at the next annual congress which will meet in Chicago, in June, 1918.

FORWARD, THE COUNTRY SCHOOL!

BY LOUIS W. RAPEER

Dean-elect of the University of Porto Rico,
Rio Piedras, Porto Rico, P. R.

We need not take space to demonstrate that there is a serious problem in rural-school sanitation. The numerous surveys of the rural-school environment of children have in each case uncovered this vital defect in rural education. Too frequently the environment of the country child is such that it develops, not life and joy more abundant, a love of growth and education, a stimulus to artistic and sanitary home environments, but on the contrary depresses, lowers even the lowest standards, and decidedly antagonizes the teaching process. The pictures and descriptions which state superintendents and investigators have given us in their reports of the condition of the rural-school plants in this country fill us, not with confidence in the regeneration of country life through the rural school but with horror and dismay. Visits to country schools for a few days will confirm their reports in most sections of our glorious country. Only a widespread awakening to the fact that our standards are very low in this respect, which is now beginning to manifest itself, gives us hope that the new rural education will radically improve the rural-school plant.

That division of educational hygiene which has to do with school sanitation is concerned not with the condition of the child directly but with the environment of the child. This environment is principally that of the school building, grounds, and equipment, but it takes in to a considerable extent the whole environment of the child. The school can greatly influence the home in matters of sanitation. The introduction of a modern force pump and water-pressure system for indoor toilets, drinking fountain, wash bowl and sink has in many instances led the farmers within range of the contagion of example to install such systems in their own homes. Simple daily questions by the teacher relative to whether pupils have ventilated their sleeping rooms or not on the night previous have had marked effect on home ventilation. The discussion of the means of spread of typhoid at school has radically improved the handling of sewage and of milk at more than one farm. Good-roads movements have started from children having to wade through water and mud, with consequent sickness, to school. Bad sanitary features such as fly-breeding manure-piles, badly-managed canning factories, proximity to a much traveled road, and consequent danger from automobiles or railway cars, have led to improvements of conditions inimical to health and limb which were quite out of the school jurisdiction. Rural-school sanitation is concerned with protecting the child from bad environmental conditions at school, and in making the whole rural environment of children a stimulus to health and normal physical development.

A sanitary environment is one which promotes the best physical and mental health and well-being. A school-room wall poorly plastered, dirty, partly covered with filthy and ugly paper put on twenty years before, with great holes through to the laths or with large circular smears

of whiter color where ancient repairs were made, and having scattered about on its surface a few old dirty posters from calendars and other advertisements, may not directly injure the physical well-being of the children in the least. It does, however, injure the mental health of the children just as much as does a cross, crabbed, kill-joy teacher. Beauty like music enters the souls of children and quietly and unerringly makes for the happy and therefore the healthy life. Accustoming children to a harmonious environment, like accustoming them to the use of good English, performs its function of contributing to several of the great aims of education aside from health, although it can be demanded and justified on this basis alone. Beauty is, therefore, almost as important in school sanitation as is freedom from disease microbes, bad lighting, and poor ventilation.

The type of environment to be made standard for all country-school children is determined by all five of the aims of education, and by many other physical and political conditions. Most educators and hundreds of thousands of patrons today believe, on good evidence, that the one-room rural school is but a pioneer device fitted to meet pioneer conditions, and one which must give way to a school which meets the needs of today and the future. Among the many rapid and wholesale transformations in education which have, in recent years, swept across this country like fire in prairie grass, such as medical inspection of schools, open-air schools, vocational education, including household arts, the playground movement, the six-six plan of organizing elementary and high schools, and many others, none has been more striking than the movement for the consolidation of schools. Tens of thousands of small one or two-room schools have been abandoned and in their place has arisen for each group abandoned a single dignified, graded school to which pupils are transported at public expense.

The ideal rural-school plant in most communities in the country is coming to be the consolidated school with a school farm; free transportation in school-owned hacks or auto vans, carrying from ten to fifty children at a load, each van frequently making two morning and two afternoon trips: a home for the principal of the school and his family; a home for the school janitor and van driver and for the other teachers; an up-to-date rural high school; an auditorium and community center; and other features making for the new education in rural communities. Such schools will as inevitably become standard in most rural communities in America as has the well-appointed and highly organized school of the cities. At present cities are far ahead of the country in their school-plant provisions. And yet the country needs reorganized and improved schools as much as the cities if not more. Too often the standard for the rural school must be greatly raised before anything else can be undertaken. A recent national gathering of educators and sociologists said: "The main purpose of this conference is to improve the rural-schools, and through these agencies to improve rural life conditions. That there is need of improvement in these lines, it is all too evident, for as President T. J. Coates of the State Normal School, Richmond, Ky., declares: 'The average farmer and rural teacher think of the rural school as a little house, on a little ground, with a little equipment, where a little teacher, at a little salary, for a little while, teaches little children, little things.' "

If the consolidated school is the rural school of the future for most regions, then it would be folly to discuss only the standardization of the

single-room school. In too many cases this has been done by state departments of education and in so doing they have made school directors and teachers think that the improvement of the single-room school was to be the end and aim of all improvements. Recently, however, such departments have been sending broadcast descriptions, plans, and specifications of high-class consolidated schools, and hardly any bulletin touching on school sanitation, including architecture, today fails to include the consolidated school. It is waste to improve at considerable expense a half dozen or a dozen rural-schools, erecting one-room brick structures in place of frame, for example, and then to abandon these, sell them for half their cost, and spend further money for a consolidated school, all in a period of five or ten years. Many school districts have, however, abandoned new and first-class one-room buildings, but in every case where a new one-room school is proposed the possibilities of consolidation within a few years should be seriously considered. Basements, indoor toilets, libraries, pressure tanks, wells, cesspools or septic tanks, etc., cost money. Extensive repairs on a one-room school, such as a new roof or stove, for the use of the children but a single year may easily be justified, but foresight here is much better than hindsight.

We must therefore include the consolidated school in our discussion; and since most of the features of the consolidated school are governed by the same principles as control the sanitation of most of the village and small-city schools of the country our standards will apply largely to them. Since many regions are poorly adapted to consolidation, although such regions grow fewer each year, and since the process of consolidation itself will consume most of this century, it is highly important that we discuss also the sanitation of the one-room school, the little school house that now is commonest in America.

A recent survey on *Schoolhouse Sanitation* by the United States Bureau of Education shows that forty of the forty-eight states, or fifty if we include the District of Columbia and Alaska, have taken some legal action toward safeguarding the sanitation of public-school buildings. This is perhaps not so remarkable when we remember that most of these states have had such schools for fifty years or more. But it is remarkable to learn that probably nine-tenths of the existing regulation of this kind has come about within the last ten years (before 1915). Recently we have witnessed a veritable renaissance of the physical conscience of the race which has lain dormant since the time of the ancient Greeks and a wide-spread interest in health and physical development manifests itself. Each state profits to some extent by the experience of others. A "law passed in one extreme of the country today is copied next month or next year by a State two thousand or three thousand miles distant."

We received the following summary of the study from the Bureau:

"Thirty-eight States have some legal provision regarding the school site according to the bulletin. Nearly all of these provisions are Statewide in their application, and are mandatory in character. These provisions include the proximity of 'nuisances,' availability of the site, and size of the site. Nineteen States have laws prohibiting the location of school buildings within a specified distance from places where liquor is sold, from gambling houses, houses of prostitution, and noisy or smoky factories.

"Thirty of the States have sought to regulate the water supply of the public school. 'The revolt against the common drinking cup,' says the

bulletin, 'has come within the past five years. Kansas was the pioneer, but other States followed rapidly, so that now half of the entire number have either a law or a regulation regarding drinking cups.'

"Some form of protection against fire and panic is found in 36 States. Blanket regulations, or the power to make such regulations, exist in 12 States. General or special construction with a view to fire prevention is dealt with in 10 States. Thirteen of the States have something to say as to corridors and inner stairways; 24 have regulations as to exits, and 25 as to exterior escapes; 10 mention alarm and fire-fighting apparatus; and 11 States provide by law or regulations for fire drills. Less than half the States, according to the bulletin, have any legal word on ventilation. Thirty cubic feet of fresh air per pupil per minute is the conventional amount specified.

"In the matter of cleaning and disinfecting, slightly more than one-fourth of the States have regulations which control conditions to any degree outside the districts themselves. Some of the laws and regulations are almost model; others are wholly inadequate. A few State boards of health have done notable work in this particular. Special cleaning and disinfecting follow in seven States immediately upon discovery in any school of any of a certain class of diseases. 'Three of the States have a special list of specific diseases that call at once for action. This list includes scarlet fever, smallpox, and diphtheria in all three States, measels in two, and infantile paralysis, epidemic spinal-meningitis, and bubonic plague in each.' "

We need more facts of this character as much as the nation needs exact knowledge of its available resources and lack of resources for the great war. The war against disease which kills without warrant an extra million persons each year in this country is one that must be fought largely in our country and village schools.

ANNOUNCEMENT FOR SEPTEMBER

Our September number will open with an excellent article on *School Medical Inspection in the City of Boston*, to be contributed by Dr. William Devine, Chief Medical Inspector of the schools of that city.

The American Journal of School Hygiene

VOLUME I SEPTEMBER, 1917 NUMBER 7

MEDICAL INSPECTION IN BOSTON PUBLIC SCHOOLS

BY WILLIAM H. DEVINE
Director of Medical Inspection

Medical inspection of schools in the United States was inaugurated in Boston by Dr. Samuel H. Durgin, and remained under the supervision of the Board of Health till the end of the school year 1914-15. June, 1915, it was transferred to the School Department.

The nurses have been under the supervision of the School Department since their organizaztion in 1907.

Forty-one school physicians selected from the Civil Service list were appointed by the School Committee and commenced duties on November 22nd, 1915. At present, June, 1917, there are forty-three school physicians.

The medical inspection corps is as follows: one Director of Medical Inspection, one Supervising Nurse, one Medical Inspector of Special Classes, forty-three school physicians, forty assistant nurses.

Every school district and every high school in Boston is visited by a school physician every school day, and the school nurses visit elementary districts according to schedule.

The school physician is a part time employee and devotes the morning to the work. He reports to the principals of his schools as near the opening of the morning session as is practicable. The nurse is a full time employee and is on duty from nine to five P. M., and on Saturdays from nine till one P. M.

The school physician makes prompt examination of all children referred to him by the teacher, principal, or nurse. If contagious disease is discovered, there is prompt exclusion, and written instructions given for subsequent precautions and advice. All children returning to school after illness or absence from unknown cause (when no certificate from the Health Department or attending physician is offered) are examined. Every pupil is examined physically once a year by the school physician. This examination is required by Chapter 502, Acts of 1906, Section 5. In addition to these duties, the school physician takes general charge of the hygienic conditions of school buildings and reports to the Director of Medical Inspection. He also gives instruction on preventive medicine to teachers and pupils.

Candidates for the certificate of assistant nurse must be graduates of a recognized training school requiring at least two years' course, and present testimonials certifying to character, health, and experience. The examination is held under the direction of the Assistant Superintendents in the following subjects: 1, Principles and Processes of Nursing; 2, Anatomy; 3, Physiology; 4, Dietetics; 5, English; 6, Arithmetic; 7, Practical Demonstration.

The school nurse assists the school physician with physical examinations, escorts children to the dental clinics, hospitals, dispensaries, etc.

She devotes much of her time to follow up work in connection with the physical examinations by making home visits and advising the parents. The follow up work of the school nurse is an important part of medical inspection.

The first test of vision and hearing is made by the teachers and the re-testing is done by the school nurses. The latter give short talks on care of the teeth, personal cleanliness, and allied subjects.

The school physician sends a daily report to the Director of Medical Inspection; every month, a detailed report of all physical examinations.

The school nurse reports to the Supervising Nurse weekly, and makes such other reports as may be required from time to time.

The salary of the school physician assigned to the certificating office is $900 per year. The regular school physician receives $504 annually; the Medical Inspector of Special Classes receives $2004.

The minimum salary for assistant nurses is $708, annual increase $48, maximum $900.

The school physicians and nurses have separate meetings once a month, and a joint meeting of school physicians and nurses is held at least once a year.

Temporary school physicians are selected from the eligible list of the Civil Service. They are assigned to take the place of school physicians or to aid the regular force when unusual conditions prevail.

Pupils for special classes are referred for examination to the Medical Inspector of Special Classes.

The school physician assigned to the certificating office examines all children between the ages of fourteen and sixteen who desire an employment certificate, when presenting a written promise of employment, and certifies in writing whether or not the applicant is, in his opinion, physically capable of performing the duties indicated.

There is much controversy as to the relative advantages of medical inspection under the control of the Board of Health or the Board of Education. In its early history, detection of contagious disease was considered the principle aim of medical inspection; it was soon realized that its scope was much broader, including the early detection of all diseases; that it was an invaluable aid in the selection of pupils for open air classes, speech defects, and special classes, and a medium for the dissemination of knowledge on preventive medicine.

Medical inspection aims to correct sanitary defects in school buildings, and embraces all problems pertaining to the health of pupils, teachers, and other employees It enables the child to embrace educational opportunities by improving his hygienic environment and modifying educational training to suit his mental and physical capacity. Medical inspection, in a measure, is educational, and the teacher is an important factor.

A Board of Health has supervision of everything pertaining to the public health, but cannot keep as closely in touch with educational institutions as the School Committee. Medical inspectors of schools, as well as the medical profession at large, are responsible to the Health Department, and this is used as an argument in favor of Board of Health control: this general supervision exists whether the doctors are under the Board of Health or School Committee.

Boards of Education have supervision of school property, and, practically, are entrusted with the responsibility of the child's mental and physical welfare. It seems plausible that they should have complete control of the medical forces that inspect their schools.

The following from "Report on Replies to a Circular Letter Concerning Fresh-Air Rooms and Out-Door Schools" issued by the Associated Committees of the Massachusetts Medical Society, to Boston school physicians, school superintendents of Massachusetts, and other persons known to be interested, gives a fair idea of consensus of opinion of experts on this subject.

"Question 5—'Should the open-air or fresh air rooms be under the control of the school department or a medical department?'—brought out a large majority of answers, 139 being in favor of such fresh air rooms being under the control of the school department or its physicians, while 55 believed that such rooms should be under the supervision of a medical department such as a board of health."

It is fair to assume that the same would apply to other departments of medical inspection.

The various activities of medical inspection do not admit of discussion in this article, but a brief outline of the more important ones may be interesting.

By circulars, the "Educational Standards," (the school medium), lectures and instructions by physicians, dentists, and nurses, a systematic effort has been made to keep before the children the importance of dental prophylaxis. School physicians are instructed to pay special attention to the children of kindergartens and first grades; to impress on teachers and parents the importance of the care of the teeth during this period. Nurses have given systematic instructions on the care of teeth and practical demonstrations on proper method of cleaning. The nurse also embraces every opportunity to instruct the children. School physicians and nurses have been in close touch with the Forsyth Dental Infirmary, and have received special instruction from the director, Dr. Harold DeW. Cross.

A committee of principals and the Supervising Nurse cooperating with the Forsyth Dental Infirmary, have made the following recommendations:

"That we approve the dental recommendation that every child at six years should see a dentist.

"That we approve the plan of the Forsyth Dental Authorities to concentrate their work upon the first three grades.

"That an active campaign of education be undertaken and a system be inaugurated to make sure that every child who passes from grade III to grade IV in 1917 shall have a healthy mouth so far as dental treatment and mouth hygiene can secure that result.

"That provision be made to give immediate treatment to any pupil who has decided to leave school and go to work, provided he is eligible for admission to the infirmary.

"That all pupils of grade VII shall be urged to have such dental treatment as they need and that their teeth and mouths shall be carefully examined by the medical inspector in the month of May of each year.

"That all parents who can afford to send their children to a regular dentist or to a clinic where there is a substantial charge, should be required to do so."

The Director of Medical Inspection has endeavored to carry out these recommendations.

Parents of kindergarteners, mothers' clubs, and allied associations have received instructions on oral hygiene at frequent intervals from dental experts, school physicians, and nurses.

As the result of the various activities and the practical work of the dental dispensaries, a great improvement in the dental situation is expected next year.

The following schedule has been carried out:

CLINIC	No. pupils escorted weekly
Pupils escorted by nurses to the Forsyth Dental Infirmary from Grades I, II, III	557
Reservations for older pupils:	
Forsyth Dental Infirmary	257
Tufts Dental College	202
Harvard Dental College	25
Hospital Dental Clinics	139
Total number of reservations weekly	1,180

From October 5th, 1916, to February 1st, 1917, there were 1,487 pupils from grades I, II, and III discharged from the Forsyth Dental Infirmary.

There are fourteen open-air classes (with two additional recommended for the next school term), averaging about one to every two hundred class rooms. The open air class room differs from the ordinary class room inasmuch as it is specially designed to facilitate the access of fresh air. In these rooms there are special provisions to shield against inclement weather.

The pupils require extra clothing, extra food, periods for rest, or sleep, special medical supervision, and individual instruction.

These classes are expensive to maintain, for which reason, if for nothing else, their universal adoption is not popular. They are not only a great benefit to the children who attend, but for the broad opportunity offered of impressing the pupils with the importance of fresh air, not only in schools, but in homes, public buildings, etc. The result is that it is disseminated throughout the community.

Children should be recommended for open air classes as early as possible. The alert teacher is a valuable aid to the school physician and nurse in the selection of the proper type. Children suffering from malnutrition, adenoids, tonsils, cardiac, or nervous diseases, anæmia, children below par, or with a history of tuberculosis in the family, are proper subjects for these classes.

The nurses visit classes daily, and the school physicians at frequent intervals.

At present the number of open-air classes is limited by the lack of facilities and the difficulty of properly grading pupils. The plan for the future is to have at least one room in every new school building specially designed for this purpose. It is the intention of the Director of Medical Inspection to organize at least two new classes every year.

Biennial, or examinations at stated intervals during school life, *e. g.*, at entrance to kindergarten or first grade, and two or three times during the course at elementary, and once in high or normal, are advocated by some authorities. The writer believes in annual physical examinations.

Some of the advantages are that it keeps the school physician in touch with pupil from his entrance until completion of school course. It precludes the probability of overlooking some morbid condition and it offers the best opportunity for detecting disease in its incipiency.

Many cases have been brought to the writer's attention where some condition, such as pulmonary tuberculosis, might have been overlooked were it not for the annual physical examination. In the latter case, not only is the best chance offered for the improvement or cure of the child, but the health of other pupils is safeguarded.

A study of the following tables may prove interesting:*

	1915–16		1916–17	
Total number of pupils examined	99,862		104,287	
Total number without defects	30,781		38,318	
Total number with defects	69,081		65,969	
Defects as follows:				
Defective Nasal Breathing				
Anterior	1,292		1,297	
Posterior	5,966		5,282	
Hypertrophied Tonsils	18,444		14,806	
Defective Palate	351		169	
Cervical Glands	18,841		7,746	
Pulmonary Disease				
Tuberculous	44		22	
Question			1	
Non-Tuberculous	683		453	
Cardiac Disease				
Organic	1,330		1,406	
Functional	1,668		1,716	
Nervous Disease				
Organic	74		48	
Functional	221		179	
Chorea	43		23	
Orthopedic Defects				
Tuberculous	88		76	
Non-Tuberculous	1,698		1,770	
Skin	3,071		2,978	
Rickets	383		326	
Malnutrition	2,110		1,712	
Mental Deficiency	431		448	
Totals		56,738		40,458
Defective Teeth				
Defective Primary	32,997			
Defective Primary (Oct., Nov., Dec.),			22,745	
Defective Secondary	23,753			
Defective Secondary (Oct., Nov., Dec.),			17,493	
Defective (classes without regard to primary or secondary from Jan 1, 1917)			15,400	
Totals		56,750		55,638
Grand total of defects		113,488		96,096

*Boston Medical and Surgical Journal, May 31st, 1917—"Comparative Statistics on Physical Examinations of Pupils of the Boston Public Schools from December 1st, 1915, to April 1st, 1917."—By William H. Devine, M. D., Director of Medical Inspection, Boston Public Schools.

HYGIENE IN THE NORMAL SCHOOL CURRICULUM

BY LAWRENCE AUGUSTUS AVERILL

Head of the Department of School Hygiene and Educational Psychology in the Massachusetts State Normal School, Worcester, Massachusetts

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There are in the United States approximately 200 state normal schools where the greater part of the future teachers in the elementary grades are receiving their professional training. Necessarily, as yet, the courses of study offered in these institutions lack coherence and uniformity. In some of them the modern languages are given, in others no attention whatever is vouchsafed to them; in some capital courses in higher mathematics are offered, in others only the fundamentals of arithmetic; in some Latin and even Greek still persist, in others neither finds a place; in some elementary algebra is offered, in others algebra occupies no place; in some laboratory courses in biology exist, in others there are no independent courses in biology. Not only are there great discrepancies in subject matter but there is apt to be also equally great variation in methods of treatment, in aims and values and in points of view. There are great individual differences in teachers and consequently marked differences in handling the same subject.

The status of educational hygiene in the normal school is not more uniformly defined than that of most other courses. Indeed it is doubtful whether as yet it has anything like a definite and acknowledged place in the curricula of our normal schools. It is a relatively new subject and new subjects have to run the gauntlet of many officials and much officialdom—to say nothing of much public opinion—before they can be admitted to our already over-stocked educational holy of holies. As an essential asset in our present-day system, however, educational hygiene is beginning to loom large on the horizon. We are beginning to demand physical fitness as well as intellectual aptness in our school children. The results of systematic school health work are already beginning to tell. We know, for instance, that 25% of all the pupils in our schools have defective vision; that 10% are suffering from malnutrition of a grave nature; that 10% have adenoids and enlarged tonsils; that 10% have enlarged cervical glands, many of them tuberculous; that 10% have tubercular infections of such a nature that they will ultimately succumb to the ravages of tuberculosis; that 75% have seriously defective teeth; that 5% have defective hearing; that 5% suffer from spinal curvatures; that another 5% have marked nervous disorders, etc., etc. In short, we are coming rapidly to an appreciation of the importance of hygiene as applied to education, and especially to elementary education.

We deem it not extravagant to say that school and child hygiene is one of the three or four chief subjects of study in the normal school curriculum, and as such should be recognized unreservedly. It is not the purpose of this paper to suggest possible lines of similarity and of unity in the courses that are offered in the various schools, but rather to outline what the writer believes to be essential in any normal school

course in educational hygiene. The course as defined below represents substantially what is given in the State Normal School at Worcester, Massachusetts. No claim is made that it is complete, or that it cannot be improved upon by thoughtful teachers. It is believed, however, that the course points in the right direction. The outline follows:—

I. Physiology. Only a small amount of time should be devoted to a study of physiology as such in the normal school. Four weeks' time will be sufficient for the student to become thoroughly familiar with the primary physiological functions, such for example as food and digestion, respiration, circulation of the blood and lymph, secretion and excretion, nervous and muscular tissue and their functions, etc., etc. The end in view in this part of the course should constantly be to insure that a satisfactory basis be laid for a comprehension of hygienic principles later on. Physiology carried to a point beyond this has little place in the normal training school, as Professor Gregg of the Peru (Neb.) State Normal School has so conclusively shown.*

II. The physical nature of the child. The purpose of this phase of the work should be largely to give the prospective teacher an entirely new viewpoint with reference to child life. She has been brought up to think of a child as a small edition of a man—in other words an adult not grown up. She must be brought to appreciate the fact that there is after all little exact similarity between a child and an adult; indeed that they are so unlike that almost an entirely new set of laws are found to be in operation in the child. Far from being merely smaller than a grown up, she should understand that the child needs a different diet; that his circulation is more rapid; that the composition of his blood is radically different; that he is more susceptible to disease; that he has only slight powers of resistance and almost no reserve energy; that the activities of the glands are very great; that his bones are easily deformed because of their softness; that his lung capacity is low, necessitating a more rapid respiration in order to permit of his greater natural activity; that he fatigues very quickly, necessitating brief periods of work; and that he recuperates very rapidly, requiring therefore brief periods of rest to alternate with the periods of work. A knowledge of each one of these peculiarities of the child has, or should have, a marked influence upon the future teacher and the conditions under which she allows her children to do the work of the school.

III. The more common physical defects to be found among school children. This should include:

(a) Vision. Chief defects of vision, notably myopia and astigmatism. Methods of testing children's eyes and of keeping permanent records for purposes of comparison from term to term. Hygiene of the eye.

(b) Hearing. Causes of defects in audition. Methods of testing children's hearing. Hygiene of the ear.

(c) Teeth. Structure of the teeth. Temporary and permanent. Causes of dental caries. "Gum boils." Care of the teeth. General oral hygiene.

(d) Tonsils, adenoids and naso-pharyngeal affections. Effect of nasal obstructions upon the school progress of the child. Removal. Hygiene of the nose and throat.

*See an excellent article on this subject by Prof. Gregg in our March number.—Ed.

(e) Curvatures and other skeletal deformities. Causes of scoliosis, lordosis, kyphosis. Rickets. Hygiene of posture.

(f) Enlarged cervical glands or other tubercular infections.

IV. The chief children's diseases. Measles, scarlet fever, whooping cough, colds, mumps, diphtheria, typhoid, scabies and skin diseases, eye diseases, pediculi capitis, infantile and other paralyses, tuberculosis of glands, bones, lungs, etc., etc. The modes of infection and the chief determining symptoms of each should be made as clear as possible to the teacher. Brief pamphlets, obtainable gratis from state departments of health, insurance companies and industrial houses, should be placed in their hands for filing and future reference.

V. Speech defects. The functional stammering and stuttering of the neurotic vs. the positive defects of speech in children whose throats have anatomical irregularities. Much emphasis should be placed upon the teacher's duty toward the former class of pupils. She should be given references to the best literature on the subject, as well as a small amount of concrete instruction in the origination of suitable drill material for given deficiencies. The psychological and moral influence of the stuttering pupil upon the normal speakers should be pointed out with care.

VI. Neurotic children. To be complete, a good course in educational hygiene should make some mention of the nervous child. No attempt can of course be made at getting at fundamental causes, which may often be rooted in the ancestral stock. Still, young teachers should understand definitely that good habits of living, plain, hearty food and a normal amount of refreshing sleep, hard play and tempered work, keen interests and wholesome companions make for a well-ordered mental as well as physical life; and conversely, that the reverse of these things are in a considerable measure responsible for those neurotic diatheses and emotional excesses not infrequently met with in school children, which, if uncorrected, may doom a child to permanent neurasthenia and perhaps complete mental unbalance in later life.

VII. Malnutrition. Older and newer notions of diet. What constitutes malnutrition in school children. Reports of studies made in various cities to determine its prevalence. Relationship between malnutrition, on the one hand, and ability to do creditable school work, susceptibility to disease, "repeating," retardation, etc., etc., on the other. School lunches, and the recent movement in the cities to provide suitable meals at small cost for needy children. What the rural and the city teacher may do to aid in a good cause.

VIII. Home conditions as effecting the health of the school child. This should include an analysis of the nature and influence of the environment outside of the school; the relationship of tea, coffee and alcohol* upon school standing and fitness for vigorous school work; the conditions surrounding the sleep of the child; the nature and condition of the clothing worn; outside work performed; home study, etc., etc.

IX. Hygiene of the school room. This is one of the most important topics for the future teacher and several periods should be devoted to its discussion. It should include:—

(a) Location and construction of the school plant. The nature of soils, surroundings, materials and workmanship, etc.

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*Recent studies show that large numbers of school children in certain of our cities habitually take alcoholic beverages with their meals.—Ed.

(b) Lighting. Proper ratio of glass area to floor space; location of windows; transparent and opaque glasses, etc.

(c) Heating and ventilation. Steam, air and water systems. Natural, gravity and mechanical systems of ventilation. The jacketed stove. Visits to local public buildings for purposes of inspecting various types. Newer notions of ventilation vs. the older "carbon dioxide" and "organic poisons," theories.

(d) Black boards and crayons. Materials, location and care.

(e) Decorations. Tints, papers and other hangings.

(f) Seating. The evolution of the school desk. Modern requirements of a satisfactory desk and chair.

(g) Floors and care of floors and woodwork.

(h) School janitors. Their qualifications and duties.

(i) Water supply. Country water and city water. Wells, storage tanks, pressure systems. Fountains and cups for city and country. The "common cup."

(j) Toilets and basements.

(k) School grounds and school landscape gardening.

X. Medical supervision. The history of the school medical inspection idea. Qualifications and duties of the school physician and the school nurse. The school clinic and its place in the economy of educational hygiene. Duties of the teacher.

XI. Hygiene of programs. Scientific term arrangement of lessons according to their average difficulty and the mean state of rest or fatigue of the pupils. What was wrong with the procedure of the teacher who had reading for the first recitation of the day in a fourth grade class and arithmetic the last thing in the morning?

XII. Methods. This should include the methods of teaching hygienic principles to grades I-VIII. The older "physiology" vs. the modern hygiene: health vs. structural anatomy. Opportunity ought to be given for each student to present before the class (if possible to a class of children) model lessons on such topics as *teeth, cleanliness, sleep*, etc. Morning inspections and how to conduct them. The students should be supplied with a great variety of sources for securing appropriate illustrative materials to be used when she actually enters the schoolroom.

XIII. First-aid in the school room and on the playground. Fainting, faintness, headaches, fits, bruises, dislocations, fractures, etc. Essentials of a first-aid outfit. The purpose of applying this in the school room lies not so much in preventing complications as in affording the children good object lessons, as occasion and opportunity may arise, in the care of their own persons.

XIV. Literature. The best contemporary literature upon all phases of school health work should be constantly made use of by the students. Assigned readings and reports in class upon the best of this will not only broaden the students' horizon but will accustom them to make habitual use of the sources and will acquaint them with what the world is doing along this important line of educational work.

XV. Miscellaneous. In addition to the work outlined above, some attention should be given to the outlines of community and municipal hygiene. Important topics for discussion under this heading would include such things as: water supply; garbage disposal; sewage; reservoirs and filter beds; markets; control of injurious insects, such as the housefly and the mosquito; together with such other allied subjects as are

important in the social training of future teachers and citizens. Much opportunity for field work is offered by this section of the course. A good assortment of lantern slides is a valuable adjunct to the entire work of the year.

The standard textbooks, such as Dresslar's *School Hygiene*, Terman's *Hygiene of the School Child*, Hoag and Terman's *Health Work in the Schools* and Rapeer's *Educational Hygiene* should, needless to say, not only form the background for shaping the course but be so continually referred to as to enable the student to become thoroughly familiar with them. Monroe's *Cyclopedia of Education* contains excellent articles upon various phases of school health work, contributed by the experts in the field.

THE STUDY OF HABIT IN A COURSE IN PSYCHOLOGY

(WITH SPECIAL REFERENCE TO HEALTH HABITS)

BY J. MACE ANDRESS

Head of the Department of Psychology and Child Study in the Boston Normal School

The purpose of the teaching of psychology in the Boston Normal School is to throw light on the learning process; for learning is the significant aspect involved in all teaching. Unless the teacher has some insight into the way children learn she can have no sympathetic appreciation of the various difficulties which they encounter in facing school problems and how these obstacles to successful achievement may be overcome.

Learning is essentially nothing more than forming habits. Every time we have an experience, no matter what its nature, an impression is made upon the nervous system so that our subsequent conduct is modified. Any experience may break certain connections in the nervous system and form new connections, or it may simply strengthen connections already formed by the repetition of a given act. Habit, as is well known, enters into all the details of our daily life governing the time we wake up in the morning, our dressing, table manners, etc., and it likewise plays a part in our morals and all those activities essential in the making of a living. The mastery of all school subjects necessitates forming habits. It is not too much to say that the teacher's success depends primarily on her ability to get children to form profitable habits. This being so a course in psychology in a normal school should obviously make clear to prospective teachers the psychology of habit formation.

One of the common methods of teaching the psychology of habit is to assign reading like the chapter on habit in James' "Psychology," and then test for results. It is my experience that pupils may be able to reproduce what is read accurately and yet fail to appreciate how difficult it is to form a habit. *The normal school student as well as the teacher in service is likely to think that habits are formed with ease when*

children know why the habits should be acquired. This is one of the most dangerous fallacies in education. If there is any one fact which stands out in the psychology of learning it is that habits are not likely to be formed by merely talking about them long and vigorously. In my Freshman Class last year I brought this whole matter to a focus by asking the students whether they had been instructed in their past school work in the high school and grades about the desirability of masticating their food properly. All pupils had received such instruction, some of them several times. A further inquiry showed that not more than 10% were satisfied with their manner of mastication, and not more than 1% of these believed that the measure of their success was determined by the instruction of the school. Probably everybody would agree that the instructions given were not successful to any great extent. Effective learning did not take place. Reference to these results, which are probably typical of all schools, is not made primarily in the spirit of criticism but to emphasize the chasm between knowing and doing. We are still guided by what Dr. Snedden has aptly called "faith aims." We still have faith that much of our instruction, which involves the getting of information, leads directly to action. If teaching is to be made better, those about to begin service must realize as soon as possible that it is difficult to form correct habits.

A vital conception of this vast gap between knowledge and habit can not be gained by mere reading and discussion, no matter how interesting they may be. The better way is to form some habit and then learn at first hand about its nature and the difficulties involved.

In presenting this matter to my classes I said that undoubtedly everybody had in mind some habit which she had long hoped to form, and that the course in psychology would give her a chance to form this habit and also get credit for it in the psychology course. A number of habits, such as taking exercise daily in the open air, getting sufficient sleep, etc., were suggested, but everybody was free to choose what she preferred. Pupils were asked to keep a diary in which they would record their daily successes and failures, their physical and mental condition and any other information which was of interest. The habit was to be practiced continuously at least for a month. At the end of that time a paper was to be submitted embodying the facts suggested, with a final summary as to what helped or retarded the development of the habit. These papers served subsequently as an introduction to class discussions and assigned readings.

The habits formed fell into five groups: (1) getting up and going to bed at a certain time; (2) proper mastication of the food; (3) taking daily exercise in the open air; (4) correct posture in sitting and standing; and (5) miscellaneous habits, a small number of varied reactions such as cleaning the teeth, keeping the hands from the face, etc.

The following extracts from a diary are typical of the class:

"I have been endeavoring to make it a habit to keep correct posture while standing and sitting. When I began to form the habit I made an agreement with myself in writing that I would constantly keep it before me as a reminder. It was as follows: I, H.. W.., seriously desire to improve my posture. To this end I promise to keep strict watch over myself and to strive unceasingly to stand and sit in correct position, taking especial care to see that my head is held erectly, and that my chest is high."

A summary of the details by weeks follows:

"Week of Nov. 12. I started to form the habit this week. It was a novelty to me so I was very much interested in it. I asked everybody at home to help me in the formation of the habit. They all agreed to give me their aid. I caught myself standing incorrectly many times each day, but I quickly straightened into the best position I could take. Altogether it did not seem as though it would be as difficult to form this habit as I had thought it would be.

"Week of Nov. 19. I had to continually remind myself that my posture was not very good. I kept my mind on it, however, and on two days of this week people remarked that I was standing very well. I did not have to remind myself so repeatedly during the latter part of this week as I had during the first part. I took pleasure in noticing in the different classrooms that when I straightened up two or three of the other girls took better positions.

"Week of Nov. 26. The first part of this week I was conscious of keeping pretty good posture most of the time, but toward the latter part I did not feel very well because of a cold, and I found it difficult to keep my shoulders back. It tired me to stand in the correct position. Nevertheless I tried to stand straight, but I did not make very rapid progress.

"Week of Dec. 3. I had a minor operation this week. This interfered badly with the formation of my habit. I let it go altogether. In fact, I almost took pleasure in thinking that I was not paying attention to my posture.

"Week of Dec. 10. I tried to stand in correct position, but found it exceedingly difficult and tiring. I think I had more failures (that is I found myself more often in bad sitting or standing position) this week than the week I started to form the habit.

"Week of Dec. 17. I am steadily eliminating failures. My posture was much better this week. I did not have to remind myself as often as I did last week.

"Week of Dec. 24. I am steadily eliminating failures. My posture was much better this week. I needed to remind myself fewer times than last week.

"Week of Jan. 1. This week the great improvement in my posture was remarked upon by several members of the class. Little conscious effort is needed to keep my posture correct.

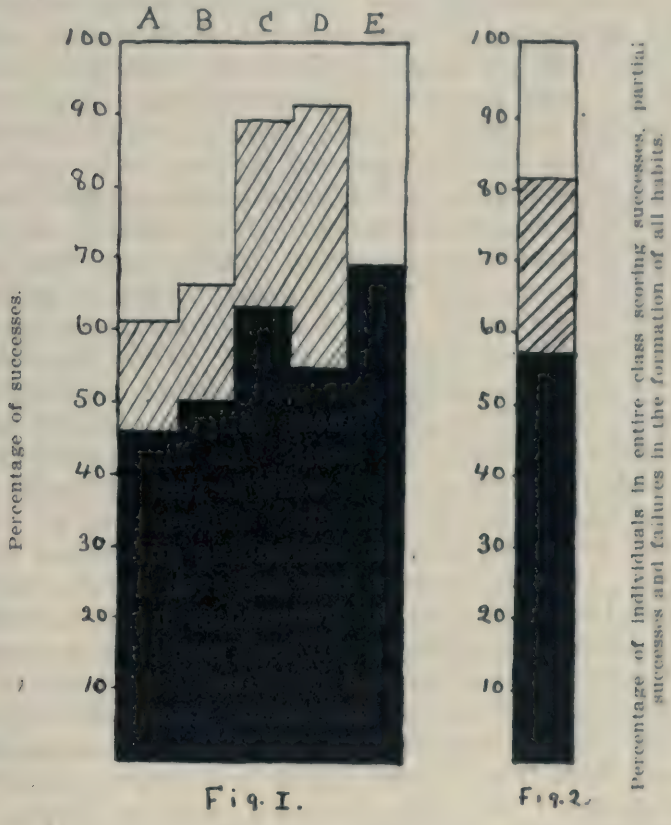
SUMMARY.

"I chose to form this habit because I think that it ought to have a good effect on my general health. I think I am now well on the way to the permanent formation of my habit. This habit-forming experiment has taught me many things. I have learned that it is not so easy to form a habit as I had previously imagined. It has taught me that interest, attention and constant repetition are things which help in forming a habit. I have found that when exceptions are permitted one becomes discouraged, and it is very hard to start the formation of the habit again. However, with constant attention, former successes may be repeated and improved upon."

About five months after the records had been kept by the pupils, I became interested to find out whether the habits practiced had survived.

Each pupil was asked to make a brief report stating whether the habit formed was still functioning as formed, whether it was partially functioning or whether it had been forgotten entirely. Eighty-four reports were received. The accompanying graph shows the results.

Graph showing percentage of successes, partial successes and failures in an attempt to form habits with a month or more of practice according to an investigation made five months after the habits had been practiced.



KEY

black areas—successes
barred " —partial successes
white " —failures

A—habit of going to bed and getting up at definite times
B—proper mastication of food
C—daily exercise in the open air
D—posture
E—miscellaneous

While these results can not be regarded as scientifically accurate they are probably accurate enough to show what took place fairly well. It is significant to note that these habits were practiced under unusually favorable conditions. The habit undertaken appealed to each individual

pupil primarily because of its worth to her, there was an added motive in a class mark, and a plan of practice was suggested leading to more than an ordinary concentration of the attention for a period of at least a month. Notwithstanding these favorable conditions the final canvas of the reports shows that the habits practiced were complete failures in 19% of the class.* This means that about one pupil in five failed. 24% of the pupils were successful in establishing their habits only partially. Success was attained by 57% of the pupils. The difficulty in forming habits is obvious. Such facts as these presented to the entire class in psychology offer some convincing reasons why their *knowledge* of the proper way of masticating the food did not function in actual *habit*.

The reasons assigned for failures in habit formation suggest some positive principles of teaching. Several say that the habit was not formed so that it was performed automatically. This indicates that the habits reported as only partially formed are likely eventually to lapse entirely. This would mean an increase in complete failures. The desirability of practicing a habit until it is automatic seems necessary to insure its future continuation. Many account for failures because they allowed exceptions to come in. The spring vacation is blamed for a number of failures. One girl who was forming the habit of getting out of bed when called says: "All went well until the April vacation. Then I stayed in bed long after I was called. When school began I still found myself lying in bed long after being called." Among the other causes mentioned for failure are illness, fatigue, and the coming in of some interest antagonistic to the habit. An illustration of the latter would be unusual pressure of school work so that the habit of going to bed at a definite time would be completely undermined.

To bridge the chasm between understanding and action is then beset with difficulties. The way is often long and even dreary. How futile it is then to expect that talking to children and even admonishing them intermittently to form certain habits will lead to their execution. Eternal vigilance on the part of teacher and pupil until the habit is well established seems necessary. Not until the teacher knows definitely just what habits she wishes the children to form and plans systematically and continuously to get them formed even "if it is necessary to fight it out on this line all summer" will her efforts be crowned with a reasonable degree of success. Otherwise instruction degenerates into something which never affects the lives of the pupils in any vital way.

It is believed that the method of teaching outlined will tend to give prospective teachers a more intimate knowledge and grasp of the psychology of habit. This enables the ordinary normal school student to enter sympathetically into the psychology of the common subjects of the school curriculum such as spelling, writing, reading, arithmetic and drawing, and likewise into problems of school management and discipline. Since most of the habits formed by the class referred to health there should be an especially good preparation for the pedagogy of hygiene, which should be concerned mainly with the establishment of health habits.

*Probably the percentage of complete failures in habits C and D would have been much larger if the Departments of Physical Culture and Oral Expression had not been trying at this time to have the same habits established.

NOTES AND DISCUSSIONS

With 9/10 of the world at war and with nearly 3/4 of a million of our own schoolboys of yesterday actively in training in the great military camps to become triumphant participators in the great struggle of democracy, we are minded of the 20,000,000 boys and girls now returning to their fall studies upon whom the future of our Republic will one day be absolutely dependent. Just as it is a high calling to be an American citizen these days, so it is a high responsibility to be an American child as yet relatively ignorant of destiny. The task of the future is to be an enormous one; to feed and clothe and train starving and helpless youth of other lands will need all the efforts of whole-hearted citizens of democracy; to rebuild shattered nations and to restore fallen household gods will need all the might of vigorous men; to accelerate the ponderous wheels of industry will need all their strength; to be a complete citizen of tomorrow will be, more than ever before, to be a man strong in body, great in soul and gigantic in mind. In the wake of all this, our school system which must prepare tomorrow's citizen, tomorrow's laborer, tomorrow's philanthropist, will be successful just in so far as it endeavors and strives unceasingly to turn out mental, moral and physical specimens of a high order. The world is weary of disease and defect which might have been prevented, of physical deformities and irregularities which might have been corrected, of mental sub-normals who might have been counsellors to kings, of moral perverts who might have been at least good citizens—and of all the other forms of educational suicide and abortion which we who know something of educational underworlds have often witnessed.

Thus it is that at the opening of another educational epoch—the school year of 1917-1918—we feel more keenly than ever before the herculean task which lies before us in striving to raise the standards of educational thought and practise to a plane more meet to fit youth for a new social, industrial and moral world which, under present conditions, is so waste and turbulent as to be in truth little more than an uncharted sea.

One of the more recently organized bodies for the promotion of a more scientific system of education is the Bureau of Educational Experiments, with headquarters at 70 Fifth Avenue, New York City. Although but a few months in existence, the Bureau already gives promise of becoming a strong factor in the directing of modern educational thought. Made up as it is of a group of persons who are themselves engaged in first-hand efforts for improving the education of children and who have all shared in the general movement that is bringing about a more scientific study of them, the Bureau of Educational Experiments aims to contribute to modern educational practice by offering an opportunity to increase the value of all experiments through coöperative effort, and by preserving and making permanent those experiments that may profitably be included in an organized system of experimental education. In addition to its own experiments, the Bureau proposes also to collect and make available for public use information concerning the whole field of experiments in education. As an early result of the Bureau's efforts, six valuable *Bulletins* have already appeared, further mention of which is made elsewhere in this JOURNAL.

The following paragraphs are quoted from *Bulletin No. 4* and afford an excellent idea of the point of view which the Bureau has assumed:—

> Up to the present, our methods of education have dealt only with the conscious or surface mental life of the child. The new analytic psychology has, however, demonstrated that the unconscious mental life which is the outgrowth of the child's instincts plays a greater rôle than the conscious. We have spent much of our time training children to think and act properly by themselves. But we have done this without being aware of the fundamental basis of thought and action. The new psychology has uncovered the true nature of primitive thought and has shown that it still lives on in the unconscious mental being of the adult as well as of the child. Most of our thinking is in this primitive or "fantasy" form; and only a minor part of our mental life occurs as *directed* thought. Yet all our methods of education up to the present time have taken into account only this later type of mental process.
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> This discovery of the fundamental sources of thought and action must bring about a readjustment in education. School problems can no longer be dealt with as they appear on the surface, for our deeper knowledge must direct our attention to the deeper realities beneath. The nature and the meaning of an action must no longer be judged by its mere external manifestations. Formerly, if a child forgot what he was told to do, lied, showed fear or disobeyed, that particular matter was taken up, investigated, or solved in some immediate way as a problem in itself. But with this new approach we know that most of such behavior, common to all children in and out of school, is significant not so much in itself, but rather as a symptom of deeper and more intricate states in the unconscious life. And the usual attempt at a surface solution of a child's behavior when, for instance, he lies or shows fear, is similar to the act of cutting off the top of a weed with the roots still in the ground. We are now able to regard such actions as symptomatic and to trace them back, step by step, to their source. Up to the present time, education has missed the real significance of the child's behavior, by treating surface actions as isolated conditions.

A total of 5,572 girls in the upper grades of New York City elementary schools completed courses of instruction in the proper care of babies during the past academic year. The instruction consisted of five 40-minute lectures and included the following subjects: "The Baby's Home," "Feeding the Baby," "Bathing and Clothing the Baby," "Sleep, Fresh Air and Exercise" and "Child Helping Agencies." This excellent work was organized by the New York Child Welfare Committee and should prove of no little value to the "Little Mothers" in their home care of baby brothers and sisters.

In the June number of the *American Physical Education Review* appears an excellent and fairly complete bibliography of physical training

and hygiene. It is contributed by Professor G. B. Affleck, of the Department of Hygiene, International Y. M. C. A. College, Springfield, Massachusetts.

One of the more interesting publications that has recently come to our desk is from California and is entitled, *Health Supervision in Los Angeles City Schools.*' The bulletin is well written, finely illustrated and thoroughly attractive. Prepared by Dr. Irving R. Bancroft, Director of the School Health Department of Los Angeles, it furnishes us an excellent account of what is being done in a large South-Western city in the way of educational hygiene. Perhaps the section that appeals to us most in this helpful pamphlet is that devoted to the subject of open-air schools. Dr. Bancroft does not hesitate to say that as a factor in the revitalization of the school child the open-air school has an importance which admits of no dispute. Los Angeles, he says, has a double incentive for the establishing of such schools inasmuch as, first, the climate is such that out-of-door life and work are possible most of the year; and second, the local tuberculosis problem is a grave one, 298 persons between the ages of 5 and 20 years having died of this disease in the last four years, while in 1916, 420 persons of similar age were reported as being sufferers from it. Inasmuch as the consensus of opinion is that fresh air, rest and good food are the elements upon which we must depend in order to secure immunity from all diseases—and notably from tuberculosis—the writer concludes that every school in California should have an open-air room in order that susceptible and delicate children may be segregated.

Students of educational hygiene will be interested to learn that the Joint Committee on Health Problems in Education of the *National Educational Association* and the *American Medical Association* have prepared, under the direction of Dr. Thomas D. Wood, a set of 52 *Health Charts* for use in normal schools, teachers' institutes, public schools, educational exhibits, etc. These charts have already been displayed at several annual meetings of each association, where they have been inspected and criticised by many thousands of school workers. It is to meet the requests which have come to it that the Committee has been led to reproduce these charts in a set of 52, each to be 22x28 inches and on stiff cardboard suitable for posting. A pamphlet containing reduced reproductions of all the charts may be had by addressing Frederick R. Green, Secretary, American Medical Association, 535 North Dearborn St., Chicago. The price of the complete set is $5.00.

PUBLICATIONS RECEIVED

TESTING JUVENILE MENTALITY, by Norbert J. Melville, Director of the Psychological Laboratory, Philadelphia School of Pedagogy. Philadelphia and London, J. B. Lippincott Company, 1917. 142 pp. Ill. 12 mo. $2.00 net.

This attractive manual is intended for the training and use of advanced students of applied psychology who wish to coöperate in the work of grading and classifying children and others of juvenile mentality on the basis of their mental development. The chief check upon the increasing practice of both schools and courts of depending much for aid in directing and handling juvenile minds upon psychological test has been the inadequate supply of trained examiners. Professor Melville's textbook should meet this need very effectively. He has put the Binet-Simon system into such standardized form, that its recognized value as a first-aid in the classification of children by mental age is immensely increased. Explicit and ample are the methods and instructions given; the supplementary work necessary to complete the results given by the Binet-Simon method is fully indicated. The book is based upon a very wide experience gained by the author in the schools of New York, Princeton and Philadelphia. In the schools, where the weeding out of retarded and defective children is urgently called for on the grounds of economy of time and money, the volume will prove invaluable as a guide to intelligent classification. It has the hearty commendation of Dr. William Healy, Director of the Juvenile Psychopathic Institute of Chicago, who has contributed a foreword to the volume.

HEALTH SUPERVISION IN LOS ANGELES CITY SCHOOLS, by Irving R. Bancroft, M. D., Director of the School Health Department. June, 1917. 46 pp. Ill.

School medical inspection, follow-up work, open-air schools, penny lunches, baths, psychological work, special classes, etc., comprise some of the things covered in this booklet. It may be ordered as Publication No. 1 of the Los Angeles Board of Education.

Bulletins of the Bureau of Educational Experiments

Bulletin No. 1. PLAYTHINGS. 15 pp. Ill. Bibliography.

How can the school make itself into a place where children can educate themselves, can learn through experimenting the meaning of the world they live in, and do it by the natural means of play? What must a school do to become a genuine laboratory for children? What are the necessary appliances with which it should be equipped? These are some of the pertinent questions which this *Bulletin* aims to discuss.

Bulletin No. 2. STUDY OF ANIMAL FAMILIES IN SCHOOLS. 19 pp. Ill. Written by Laura B. Garrett.

A rather new and therefore interesting point of view is that the stern doors of the schoolhouse should be thrown open to admit the historic friends of children—the animals. Yet this is exactly what we are told we should do:

> Children and animals have always seemed a natural and wholesome combination. One hates to think of a childhood without pets. Yet that is the sort of barren childhood which the vast majority of our city children nowadays are spending. There is no place for these little dumb friends in the crowded homes, the crowded streets and the crowded days of our modern city life.
>
> As in so many other ways, if old privileges are to be kept for children under new conditions, the school must be the means of bringing this about. If modern city children are to know the joy, the beauty, the significance of animals, it is necessary that they be included in the children's school home. The description in a book is but a tame, a pathetic substitute for the live creature. A chipmunk was taken as a visitor to a New York East Side class. Those twelve-year-old children thought the little striped creature was a tiger! They had studied a tiger in a book.
>
> To use animals in a school room along with other lessons is quite in keeping with the general loosening up of school practices. It is one more way of letting a child learn through his natural curiosity and pleasure. But, like other expansions within a class room, it involves adaptations. It raises practical problems which need practical answers.

Bulletin No. 3. EXPERIMENTAL SCHOOLS: THE PLAY SCHOOL. 22 pp. Ill.

In a world devised for adults, any environment which is arranged for children is open to the criticism of being artificial. Some time in the future, when industry, commerce, art, publicity and all social enterprises are developed in the measure to which they contribute to the growth of the race; when libraries, picture galleries and zoölogical gardens are arranged for children as well as adults; when parks and playgrounds and streets serve the purpose of the whole community rather than the interests of a few, and when the attitude of the grown-ups is an educational one, we may turn our children loose in an environment which will permit them to grow in a natural way, and thus escape artificiality. But until this comes we shall have to adopt some plan of education which is confessedly artificial and try to reduce the artificiality to a minimum. This is what is attempted in the Play School.

Bulletin No. 4. EXPERIMENTAL SCHOOLS: THE CHILDREN'S SCHOOL, TEACHERS COLLEGE PLAYGROUND and THE GREGORY SCHOOL. 31 pp. Ill.

A series of three interesting, though necessarily brief, accounts of real educational experiments into the play instinct of children.

Bulletin No. 5. EXPERIMENTAL SCHOOLS: THE STONY FORD SCHOOL. 26 pp. Ill.

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HEALTH NEWS, The official monthly *Bulletin* of the New York State Department of Health, Matthias Nicoll, Jr., M. D., *Editor*. Albany, August, 1917. Vol. XII, No. 8. 22 pp.

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THE HYGIENE AND PEDAGOGY OF HABIT

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To the layman habits are certain very obvious things that we are quite well aware of and whose character we know whether good or bad. This is strictly in contrast with the view of the psychologist. To the psychologist habits are in large part forms of reaction of which we are unconscious and of which we can become aware only by some special test or some unusual experience; and as to their character whether good or bad this is usually a relative matter. We have definite groups of habitual reactions for the various familiar situations of our lives and for our usual activities, —a group of reactions for the rooms in which we work, for the doors through which we pass, for the streets along which we walk, the vehicles in which we ride, for the people we meet, for our sitting, our walking, our eating, our sleeping, our dressing, our speaking, and singing, and even for the things we see and remember, and for the thoughts we think. Of many of these we become aware only by experiment or in unusual situations.

Especially significant for us are the groups of habits in the different scholastic processes, habits of reading, of adding, of writing, etc., as well as the various habits of preperception and association involved in our permanent interests.

Each scholastic process represents a group of habits. In the New York Teachers' Monographs an attempt is made to give an illustration of the habits of the school; but unfortunately the teachers considered merely the grosser and more superficial groups of habits and were unable to analyze these into the separate habits of which they are composed. It is only by trained introspection and by experiment that it is possible to analyze and determine more concretely the elements in these groups of habits. Take, for example, the training in arithmetic. All this represents a very important group of habits. Some of these we can detect by experiment. For a single illustration, take the suggestive results of a recent experimental study.

Professor Cole [6] found that twenty-nine out of thirty persons selected at random had the upward adding habits, one, the reverse. Very few of them had an introspective knowledge of their habit of adding upward, and many of them thought that they could overcome the effect of habit by attention. Tests of rapidity and accuracy indicated that this general habit of adding conditioned more subtle habits of perception and association.

Habit in its simplest form is a simple sensori-motor coördination, but in any skillful act we have also complex or integrated groups of coördinations. We are likely to have also associations with the sensory stimuli to

these motor coördinations, and reactions to these, *i. e.*, conditioned reflexes. The learning of any accomplishment or the acquisition of proficiency in any school subject or the like involves also the formation of a hierarchy of habits. This has been admirably illustrated by the studies of Professor Bryan and Mr. Harter [4 and 5] in the learning of the telegraphic language, and by Book, [2] Swift, [16] and others, in their studies of learning The views of what constitutes a hierarchy of habits differ. Bryan in his classic study of the learning of the telegraphic language described it as follows:—

"A hierarchy of habits may be described in this way: (1) There are a certain number of habits which are elementary constituents of all the other habits within the hierarchy. (2) There are habits of a higher order which, embracing the lower as elements, are themselves in turn elements of higher habits, and so on. (3) A habit of any order, when thoroughly acquired, has physiological and, if conscious, psychological unity. The habits of lower order which are its elements tend to lose themselves in it, and it tends to lose itself in habits of higher order when it appears as an element therein."

These studies show that it is specially important to follow the right sequence in the acquisition of the hierarchy of habits involved in a given subject; in other words, some habits should be acquired before others. This general law is not a mere empty statement of what we all know, but it opens a wide field for investigation of the utmost importance. The problem for pedagogy is to determine the proper sequence in the acquisition of habits in any subject. Careful and painstaking investigation is required to determine this; and in every subject of the curriculum there is good opportunity for such research; for our practice is based merely upon the empirical results of experience,—good enough, perhaps, in many cases, and yet very erroneous perhaps in others. The study of the actual processes of learning different subjects, is a very fruitful method. Bryan found results that led him to conclude as regards the telegraphic language "(1) that by no device is it possible to gain freedom in using the higher language units until the lower have been so mastered that the attention has not been diverted by them; and (2) that it is, nevertheless, wise at all stages to practice with the highest language units possible, and thus learn all the units in their proper setting."

It is of special importance that the elementary habits formed be propaedeutic or preparatory to the higher and more complex ones in the given hierarchy. And here our guide must be the laws of development both physiological and psychical. Thus in the physiological development, as already noted, the larger, more fundamental, or more central, nerve centers in a given physiological series are developed before the more accessory and peripheral. Hence, for example, since the nerve centers that control the muscles of the shoulder and arm are developed before those controlling the finer muscles of the hand and fingers, the order of training should conform to this sequence. The motor habits developed by the use of arm movements in making lines and ovals on the blackboard are propaedeutic to the habits of finer coördination involved in ordinary writing. Scribbling, a natural stage of manual activity, is propædeutic to writing.

It is obviously essential for hygiene that this natural sequence in the development of habits of skill should be followed. Much investigation is needed here.

It is the province of experimental pedagogy to work out this sequence for each special subject of instruction. In like manner it will be necessary in the new science to be developed in the not distant future, the science of experimental ethics, to work out the proper sequence in the development of moral habits. The tremendous importance of this is emphasized by the modern studies of Freud and his school. Its significance for hygiene is obvious when we consider the danger to health from premature and unrelated forms of moral development.

The economy of habit has often been pointed out by James (11) and many writers since his time. We should make as many useful acts as possible habitual and automatic. All acts of this kind are performed with the minimum expenditure of energy.

Whenever we have to think what to do, whenever we must give conscious attention to an act, energy for both the thought and the act is required. When we perform an act automatically, energy for the act only is required. Fortunately, according to the law of parsimony, consciousness tends to desert those processes where it is no longer needed. This dropping of all supernumerary consciousness not only saves energy, but ensures security of performance; for it is a matter of every-day observation that we make no mistakes in those coördinations which have become automatic.

Habit makes it possible to perform the same operations more easily. The nervous mechanism may be the same for the habitual act as for the initial response in learning, but it runs more smoothly, and unessential processes are eliminated. As Dr. Pike has well expressed it, habitual acts are performed with a minimum of afferent impulses, a minimum of attention.

It would be easy to show the enormous advantage of making all the mechanical processes of life and of learning, such as the mechanics of reading, writing and the like, habitual, so that energy may be saved for higher and more important and more difficult matters. This is all true enough and tremendously important,—but there is another side to the matter.

A great part of our so-called education for many persons consists in the organization and automatization of habits of error as well as correct habits. The result is that the saving from habit is purchased at the expense of accuracy or else is offset by waste from interference of association.

Habit is a good thing when the correct processes are made automatic, and may be a very bad thing when both correct and incorrect and unessential processes are fossilized into habit. The tragedy of school education is that so much of the time is spent in the repetition of things partly erroneous.

Of course the important pedagogical principle is to take pains that all habits formed shall be of such a character as to be propaedeutic to habits of a higher order, that they be habits that may fuse either in whole or in part in the organization of the higher and more complex habits.

Dr. Fernald in the school for the feebleminded at Waverley has, I understand, worked out a program for the education of the feebleminded distinctly with regard to the pedagogical sequence of the occupations. Not only is the attempt made to have each occupation adapted to the stage of development of the defectives to be trained, but also to have all the habits involved in the different motor occupations propaedeutic to the

occupations that the children will take up later on. Of course it is much easier to do this in the case of the feebleminded than in case of normal children because their development is permanently arrested, and when once the diagnosis has been made determining the stage of development on which the pupil stands all that is necessary is to work out a series of motor exercises for that particular physiological age so arranged that each shall be propaedeutic to those that follow. While it is much more difficult to adopt such a plan among the normal, so far as possible this should be done, and the teachers of the public schools could learn more perhaps from studying the methods adopted for the feebleminded than in almost any other way.

We can at least in the teaching of normal children avoid the teaching of positive error and direct training in erroneous habits. We are yet in our practice far from doing this. The custom of giving errors to be corrected, of covering the blackboard with misspelled words, mispronunciations, barbarisms, solecisms, and improprieties to be corrected, and especially the presentation of any erroneous form of pronunciation or of other motor accomplishment is always a doubtful method.

The rule then is to avoid all erroneous reactions and to make all habits that are formed propaedeutic to habits of a higher order. But a moment's reflection shows that, however desirable all this is, and however necessary it is to strive for this ideal as much as possible, no one but omniscience could devise a program that should perfectly conform to these principles, and only in a pedagogical Utopia would it be possible to shield children from forming erroneous and conflicting habits. Hence we see the need of breaking habits. While theoretically this may not be possible, and every habit broken down probably leaves its trace in the neural mechanism, nevertheless for practical purposes it is true that we can break up habitual forms of reaction, and the ability to do this is the mark of health and sanity. Hence it becomes almost if not quite as important to study methods of unlearning as to study methods of learning. Let us consider this subject for a moment on the different levels of habit.

Let us consider first of all the temporary or incipient habits formed in children as shown by the method of the conditioned reflex in the experiments by Krasnogorski. [13] The characteristic of the thoroughly normal child is the ease with which the conditioned and memory reflexes are broken down. In the case of the defective or neurasthenic child the conditioned reflex persists after the desirability of it has ceased, and it is only with difficulty that it is broken down. One of the difficulties in educating the feebleminded is that it is hard for them to unlearn.

An ordinary sensori-motor reaction is called an unconditioned reflex; the reaction to some impression associated with the ordinary sensory stimulus, a conditioned reflex.

In case of certain neuropathic children the breaking down of such conditioned reflexes occurs very slowly. For example, in case of a five-year-old child of this type with whom a conditioned reflex upon a dermal stimulation had been relatively quickly formed, the stimulation had to be repeated without the accompaniment of the usual stimulus, the giving of chocolate, thirty-one times in order to destroy the reflex. Such a defect is looked upon as indicating serious disturbance of the cortical activity, the brain lacking in this case the power to break down useless associations.

Again in the learning of various kinds of skill, typewriting, and the like, experimenters have found that the ability to become expert, or in

other words, the ability to acquire the higher order of habits depends largely on the ease with which one can break down the habits of a simpler and lower order.

Richardson [14] has summed up the important facts as follows:— "Where useless associations or habits persist and cannot be broken up, there is no progress... It is the inability or lack of proper incentive to break old associations and thus prepare the way for a higher level of activity that keeps the learner on the plateau. In the acquisition of skill, habits are formed only to be broken up. In fact their most important function seems to be in allowing themselves to be broken up. They are the raw material for the next level of habit formation, and habits of this higher level the raw material for the next, and so on throughout the hierarchy of habit formation. As Bryan and Harter pointed out for the telegraphic business, most operators continue to use the raw material of what would make for skill if their old habits could be dissociated and reassociated into more efficient work. . . . Book found for typewriting that elaborate and circuitous methods of writing were constantly being simplified if there was progress. There went on at the same time the elimination of old habits and the recombination into new ones. Some of the earlier habit stages seem to have existed only to be eliminated, but most of them, as well as many of the seemingly useless mental strivings and acts, played an important role in the development of the higher order of habits. 'They constitute the raw material from which the more direct and economic habits are necessarily a precondition for their attainment. Those not used must be discarded regularly, discarded as fast as outgrown to keep the learner's progress from being arrested on a lower level of attainment than he is capable of.' "

In the higher and more complex forms of habit the same is true. Progress requires the ability to break down old habits and systems of thought. Just as soon as a man loses the ability to do this, arrest of development begins. As soon as one gets a closed system, in philosophy, or in education, or what not, further development ceases. The system may be an admirable one and an economic device that will enable the individual to do most efficient work, but further development ceases here. Henceforth the individual is a political or religious or philosophical or scientific moron, as the case may be, or else he becomes an intellectual neurasthenic in these fields; but normal progress is henceforth arrested.

Fortunately conditions in this world do change, and this makes readjustment, reorganization, adaptation necessary. Just as soon as the old reaction becomes inadequate or unfortunate, or as soon as doubt arises in our thinking, readjustment, adaptation to new conditions, the new situation, becomes necessary. This conscious readjustment to a new situation is the other important part of education. From this point of view the function of education is the mediation between old and new habits, usually between habits of a lower order and habits of a higher order. It was thus perhaps that consciousness first developed. This has been well expressed by Professor MacVannel [12] in his book on The Philosophy of Education, as follows:—

"It should be noted again that all consciousness appears when and where the old habits, the so-called organized reactions, break down or need modification. The nature of the personal or social consciousness of a period is determined by the nature of the stimulus, *i. e.*, by the sort of obstacle to be overcome. Habit, organized reactions, are the organized

aspects of adaptation or adjustment. Adaptation, readjustment, reconstruction, is effected through consciousness. In terms of the social process, habits, customs, institutions, represent the conservative aspect; accommodation, attention, interest, discussion, discrimination, represent the organizing and reconstructing aspect of the societary process. All consciousness is accordingly experience of transition, organization, reorganization, reconstruction. In its work, its activity, what it does, is located the unity and continuity of the conscious process, whether in the individual or in society."

Thus the function of thought, of consciousness, and of education in the aspect we are now considering, is mediation between one level of experience and another, between an old habit which has failed or become inadequate and a new adaptation to the conditions of our environment.

Thus change of conditions means education. There must be adaptation to the new situation. Old habits must be broken and new ones formed. This is the condition of progress, and wherever either in the individual or in society a plateau, a dead level of achievement, occurs, the shock of change is necessary to bring about adaptations of a higher order.

All of this suggests, too, the great advantage of a changing environment, the educational value of travel, of meeting people who are different from ourselves, of encountering novel situations, of migration of students, and the like. In many cases of nervous disorder the best means of cure seems to be a total change of scene, as this renders the breaking up of morbid habits easier.

We must suppose that sooner or later the process of the organization of habit becomes practically complete. With some men it comes sooner, with others later.

We cannot say when that point is reached; but when it *is* reached it is from a physiological point of view the day of judgment. The individual may go on in his old ways; but the acquisition of new forms of activity is impossible.

It is probable that this organization of habit becomes complete in regard to some functions before it does in regard to others. We never perhaps live long enough for it to be complete in all. On the physiological side it should be noted that some of the nerve cells continue to develop throughout life; hence there is the possibility of new acquisitions. But for practical purposes in the case of most men it seems to be true that their habits become organized, their characters, as we say, established; and one who knows the fundamental motives in human life, the great human instincts, and also the habits of the individual, can predict pretty accurately just what a man's behavior will be in a given situation. As regards Titchener's second level of habit this is especially true, as was described long ago in a classic passage by Professor James. (11, p. 121.)

"Already at the age of twenty-five," says James, "you see the professional mannerism settling down on the young commercial traveller, on the young doctor, on the young minister, on the young counsellor-at-law. You see the little lines of cleavage running through the character, the tricks of thought, the prejudices, the ways of the 'shop' in a word, from which the man can by-and-by no more escape than his coat sleeve can suddenly fall into a new set of folds. On the whole it is best he should not escape. It is well for the world that in most of us, by the age of thirty, the character has set like plaster, and will never soften again."

This then is the function of education,—organization, adaptation, elimination of consciousness, automatization, foscillization if you please; but all this is the condition of higher and more complex organization and development.

Two great aims in education are emphasized by the psychology of habit. On the one hand, the aim of developing right habits and hierarchies of habits in the different school subjects and in education in general. This is emphasized by all the books on the subject. It is of course tremendously important; but the other side of it is equally important. In the whole course of education, in order to develop the higher, the breaking down of habit or the fusing of simpler habits into more complex habits is essential, although the significance of this has seldom been emphasized by pedagogical writers.

The books are full of exhortation in regard to the importance of forming good habits; but the term good habits is always a relative one. Habits good today will not be adequate tomorrow. Hence, the aim of education is twofold; on the one hand, to form good habits as far as possible; on the other hand, to retain that plasticity or vitality, or what one may please to call it, which makes possible the breaking of habits when they become useless and the forming of new habits.

It is well here to take a lesson from Rousseau, and to avoid developing any habit unless we are sure it will be useful.

Habit like instinct is helpful to us on the whole. But the advantages of both come when the conditions remain the same; when conditions change, then both may be disastrous.

In our modern civilization, and the hurry and bustle and distraction of modern life, most intellectual workers waste a vast deal of nervous energy by improper habits of work. The methods of work that we have been taught, and that were good fifty years ago, are impossible for the worker today. We were taught to be saving of time and paper and a hundred things. We were taught to do a thing ourselves if we wished it done, while for many of us today the great lesson is that of trusting someone else to do things for us. In short we were taught to do a great many things which were essential then, but are not essential today. Consequently the man of today often finds himself hampered by such habits of attending to the unessential as are illustrated by what Edward Eggleton says of himself. When I was a boy, he says in substance, the reading Mrs. Edgeworth's "Waste Not, Want Not," made such an impression upon me that to this day I cannot cut a string in opening a parcel, without compunction. I have saved a few feet of twine, but I have spent time that was much more valuable, in untying knots. And he rightly says nothing is more dangerous than a moralist or an economist without a sense of proportion. We need to be trained to ignore the unessential, and only by acquiring such habits can we stop the waste of nervous energy. But the essential changes; the essential for one man is not the essential for another; and this accounts for the condition in which we find ourselves today. We are in a new and complex civilization, surrounded by new conditions, and we have not yet adjusted ourselves to them. Hence the intellectual worker of today is in special danger from wasted energy and overwork; and not without reason the charge is made that as a people we are "on the verge of universal nervous prostration."

The general pedagogical inference is that in early life generic rather than special habits should be acquired. Such are propaedeutic to more

complex and special habits that may be necessary later; and for generic habits of course conditions are less likely to change. It is better to train your child to be observant and economical in regard to a few important things than to teach him to notice and save every piece of string or scrap of paper on the roadside, unless you are sure he is to become a ragpicker.

The enormous waste of energy that results from pedantic and useless habits that have survived from obsolete conditions of life, is not a matter of indifference to hygiene. But this is by no means all. Such habits are not a mere passive burden; but they are likely actively to interfere with the acquisition of new forms of behavior, new methods of work, and normal functioning in general. Thus it becomes a matter of prime importance in mental hygiene to avoid interference of habits and interference of association; and habit, which is a good thing, because it simplifies activity and eliminates unessential elements, may become a bad thing when it involves unessential and distracting elements and makes them permanent. How commonly the latter is the case has been repeatedly shown by the studies of the so-called efficiency experts who have demonstrated the great number of unessential movements executed by the ordinary individual worker in almost any industrial occupation.

INTERFERENCE OF HABITS

In the process of learning, even when lower order habits are superseded by higher ones, or when useless habits seem to be broken up, they may remain latent, and in moments of inattention, fatigue, or the like, interfere with the new habits.

Book [2] found noteworthy examples of this in the learning of typewriting. He says:—"It was observed by the learners that the older and more elemental habits used in the earlier stages of writing tended strongly to persist and force themselves upon the learners long after they had been superceded by higher-order habits. At every lapse in attention or relaxation of effort, the older habits stepped forward, as it were, and assumed control, thereby tending to perpetuate themselves. Only when a high degree of efficient effort was being persistently applied, only when the learners were urging themselves forward so hard that these outgrown habits had no chance to be used was attention forced to lay hold of the higher and more economical methods of work."

This co-existence of habits, especially where some of them are not thoroughly organized, is the occasion of much interference of association and much confusion. The antagonism and conflict have been described in a general way by Professor Royce as follows:

"To illustrate: Let the new stimuli be the sounds of certain words heard in this connection for the first time. The new habit, which this series of words would by itself tend to establish, would take the form of a power to repeat just that series of words. But now each one of these words may already have other habitual associations. If any one of these associations is so strong that it tends at the moment to get expressed in acts, these acts, so far as they become realized, will prove antagonistic to the formation of the new habit. In general, if familiar objects are already known to me in certain connections, it may be for that reason all the harder to learn to remember them in new connections. Or again, suppose that I am required to repeat some familiar act or series of acts, in a novel order, as for example to repeat the alphabet backwards. The new

habit will meet at every step with a certain opposition due to the persistence of the old habit. A complex case of the difficulties in question is furnished by the perplexities of a countryman who first comes to live in a city, or by the vexations of a traveller in a foreign country. For, in all such instances, many of the new impressions tend to revive old habits, and consequently tend to hinder the acquisition of those new habits which are needed in order to adjust the stranger to his novel surroundings." The countryman would quickly learn city ways if he could forget his rural habits. We get the clearest illustrations of such interference perhaps from antagonistic motor habits. Professor Jastrow has given many illustrations, among others the following:

"Another example," he writes, "of such conflict of motor impulses may be arranged by attempting to write not by direct visual guidance of the pencil, but by following the tracing of the point (with the hand and pencil screened from direct sight) in a mirror or system of mirrors. The new and unusual visual guidance tells one to move the pencil in a given visible direction; but this direction of seen movement has always meant a certain kind of 'felt' movement; and when that type of 'felt' movement is set into action it proves to be by the visual standard, completely and obviously wrong. The struggle between trying to push the pencil in the direction one *sees* one ought to go, and also in the direction one *feels* one ought to move, may become so intense as to be quite agonizing; and the attempt must be abandoned as hopeless. Remove the mirrors and use the normal visual guidance, or close the eyes and use the normal muscular guidance, and the writing proceeds fluently, with but normal effort and attention. Oppose the two factors of the normal combined and harmonious synthesis, and confusion irresistible—a confusion, not of conscious intent, but of execution, of deep-seated automatic motor mechanisms—takes place."

In all the investigations of school studies and the studies of the learning process we find evidence of this interference of association. Burgerstein found recrudescent memories liable to interfere with the process of reckoning and to cause error. Arnett found that errors were frequently made from the interference of some preceding figure that delayed in the mind. Cole, [6] too, found from introspection that "one type of mental confusion is left to be an experience of too many impressions at once."

Similar interference is a serious obstacle in the training of animals. Watson [16] in his classic experiments in which he deprived rats of the possibility of receiving most of the extra organic sensory stimulations found that after the animal had thoroughly mastered the maze, that is, just after he had learned to eliminate all errors, "from this point on he could be depended upon to do his work with steadiness unless some disturbing sound was made while he was passing some important turn in the maze. If even a slight noise were made at such a time, he would make a serious error, and unfortunately, this error was made on the succeeding trips at the same place again and again. If one such error were made, the connectedness of the whole series of movements was likely to be interfered with—the animal would get hopelessly lost. When in this condition, there was nothing left to do but to put him back in his cage and let him 'sleep it off.' "

There are probably great individual differences in the facility of acquiring habits just as there are differences in the ability to break up habits. Very likely there are two distinct types: on the one hand those

who for the most part acquire habits only by the slow process of repetition; on the other hand, those who acquire many habits by shock, as we have called it, or a single vigorous initial reaction. The existence of such types would explain many remarkable feats of learning as well as the difficulty that certain individuals have in acquiring certain forms of reaction. In any case there are probably great individual variations.

In fact, Cole found two classes of chicks, as regards their reaction to pain stimuli. "With the difficult condition of discrimination," he adds, "strong stimuli divide the chicks into two groups, those which succeed in learning to discriminate by reason of more right choices at the beginning of the training series and consequently fewer pain stimuli, and those which fail because of fewer right choices and more pain stimuli in the earlier trials So far as I determined the sensitiveness of the chicks it may be said that on the average the more sensitive chicks learned more rapidly both for strong and for weak stimuli."

The schools have put a premium on certain learning types. If an individual has a somewhat unusual method of learning, he is likely to be a misfit in the ordinary class. The school has neither time nor patience for the individual who belongs to an unconventional type, who has perchance the initiative, the ability to do things for himself in his own way; in a word, that matrix of originality out of which the works of genius spring.

The individual who is easily susceptible to suggestion apparently belongs to a type that learns by shock. A suggestion which is really effective is always a shock, that is, it brings about a vigorous reaction. Hence the great advantage in using the method of suggestion instead of the method of demonstration in the classroom because the pupil who receives and acts upon a suggestion not only does the thing himself, but makes a vigorous reaction.

We referred thus to the acquisition of skill in any special school subject as involving the acquisition of a hierarchy of habits, as indicated by Dr. Bryan's [4] study; but such a hierarchy of habits is involved also in the learning of relatively simpler accomplishments. The child learning to walk, for example, gives a good illustration. By reference to Miss Shinn's study of the development of a child one sees the stages of progress in the acquisition of this relatively simple motor habit. In all learning and acquisition of skill we have such habits or hierarchies of habits. And, as already suggested, in any hierarchy of habits those of a lower order may persist and be the cause of interference of association. Book, [2] for example, found, as he expresses it, that: "Long after a way of locating or making certain letters and words had been superseded by a higher and better way the old habits tended to recur at every relaxation of attention. This tendency could be overcome only by keeping attention so persistently and strenuously applied to the writing that the highest possible habits were used. It was the development of this habit that forced the learners to make new adaptations and short cuts in method and enabled them to leave the old and less economic ways behind as fast as they were sufficiently perfected to permit the development of new and better ways of writing." And one of his observers reported that "The tendency to continue the old process of spelling a word, letter by letter, which has long been outgrown, and for which there no longer is time, is very strong. It requires special effort and continual care to keep from dropping into these older and slower methods of writing. You only outgrow them when

you sprint sufficiently to leave them behind, or go so fast that they cannot come in."

If we pass from the laboratory to every day life and its psychiatry, we find interference too commonplace ordinarily to be reported, and more frequent perhaps in our mental habits of association than in our physical habits.

From the point of view of hygiene the most serious aspect of habit is perhaps the fact that all kinds of associations are liable to be involved in it. The remarkable studies of the conditioned reflex by Pavlov [7] and the Russian school have shown that any impression, from any sensory organ whatever, may become associated with the stimulus that ordinarily produces a reaction and produce the same reaction. Thus it is easy to see that in the formation of habit various associations may be formed which may be significant in the production of conditioned reflexes or attitudes or, if nothing more, give an affective coloring to the act in question. Thus every habit however indifferent, is likely to be a habit of health or the reverse. The most neutral habit is by no means a matter of indifference to hygiene, but on the contrary every habitual mode of reaction is likely to have its hygienic significance.

HABIT VS. SKILL

Thus far the word habit has been used in the ordinary generic sense. In coming to closer quarters with the hygiene of the learning process it is well to note what in ordinary language would be called the relation of the will to habit. At least the distinction should be made between habits due to the mere reaction to one's environment and habits of skill acquired by voluntary training.

Gutzmann [9] sharply distinguishes *Gewöhnung,* habituation, and *Gewohnung,* habit, which is the result of habituation, on the one hand; and *Übung,* practice, and *Fertigkeit,* skill, on the other hand. Habit and habituation are chiefly the result of influences affecting the individual from his environment. Practice, on the other hand, is usually independent of the environment. Gutzmann illustrates this by the case of a pickpocket. Such a thief has the ability to steal skillfully. It is a form of skill acquired by practice. The inclination on the other hand to commit such a theft and the continuous downward course of the thief in his activity, is a habit. In spite of the best efforts he may be unable to withstand the stimulus of a given opportunity to steal. He has then become an habitual thief. Again, as Gutzmann puts it, in the case of habit the immediate cause of the habit lies outside of ourselves. In practice it lies within ourselves. Thus practice is exactly the counterpart of habituation and habit, and represents a principle of the utmost importance in pedagogy and in medicine.

Of course the work of education is that of giving practice for the sake of forming skill. Gutzmann gives as illustration the attitude of the child in the long period of practice in mastering any subject like reading. Unless this practice is constantly sustained by the will, the tendency is for one to omit it; and this enables us to understand the child reported by Gutzmann. A little girl still struggling with the difficulties of practice in reading asked her mother who was reading a book, "Can you read, mamma?" The mother replied, "Yes." The child answered, "Why, then, do you keep reading?"

The acquisition of smoking, as pointed out by Gutzmann, is a good illustration of the way a form of skill is acquired, and then later becomes a habit. In the beginning, smoking is practice. A youth is distinctly active in this. At first he must overcome very strong disagreeable feelings, and often it is only the fear of being laughed at that impels him to scorn them and keep trying until, finally, the desired skill is attained; then at a later period in the case of many men habituation causes the acquired form of skill to become a bad habit. Such men are no longer in a condition to give up cigars or cigarettes. They do not control the smoking but the smoking controls them.

For each important organ of the body we have a group of habits. Let us take the voice for example. Speaking, reading, singing, each represents a group of habits. Among the habits of speech, many bad habits, dating often from infancy, have been described by Gutzmann. Most of the so-called defects of speech, such as lisping, various forms of faulty articulation, and even stammering and stuttering, are usually bad habits; and as regards some of these, certain forms of lisping and the like, the individual may not know at all that he has them. Dr. A. Gutzmann has illustrated this at length from his own experience.

Likewise for the other organs of the body, groups of habits are formed in the early years, and later often special forms of skill.

The total of one's modes of reaction constitute one's character, one's personality. As regards this, we have little except the old maxims and general statements. For these a recent article by Dugas in *L'Education* may be consulted.

All this has often been discussed. What has not usually been emphasized is the fact that one's mental and physical health likewise is determined largely by one's habits.

Apparently there is a striking difference between the child and the adult in regard to the forming of new habits. The studies of Krasnogorski, [13] already noted, indicate that at least the incipient habits of association are readily broken down in the normal child. Something of this plasticity it seems possible to retain in later years. Health, efficiency, and moral character all depend largely upon conserving this.

The true moral autonomy consists not in following the alleged dictum of Rousseau, to form as few habits as possible, nor in any Utopian selection of the habits to be developed, in any Spencerian or Sunday school perfection of conventionally good habits, but rather in the ability to break down any habits that are formed and make adjustment to new and chinging situations and to acquire methods of thought and action of a higher order. Bernard Shaw is reported to have said that hanging should be the punishment for anybody who attempts to say how another individual should be educated. But the real moral and intellectual homicide, which perhaps he had in mind, is not that of imposing a hierarchy of habits upon other individuals so much as the crushing out of adaptability, the power of breaking up old habits and forming new ones; this is the real arrest of development; this is the fundamental danger also to the mental health. Plasticity, adaptability, adjustment, mean youth, sanity, and mental health. Habituation and inability to adjust to a changing environment, mean senility, often mental disorder.

A man is often said to be physically just as old as his arteries; and his age is often gauged by his blood pressure or the functioning of his heart or his glands, or by the development and character of his bones, or of

some other physical organ or function. In like manner one's psychological age can be gauged in a general way by one's plasticity or his ability to adjust to new conditions. When an individual can no longer adjust to an environment that cannot be changed he is already senile even if his chronological age be under thirty.

All the forms of skill, however, acquired by voluntary practice, all the permanent habits of association, *i. e.*, interests acquired by study, are so many achievements in adjustment and potentially so many means of self-control, so many safeguards of health.

Thus sound education is distinctly a means of health, and learning a condition of normal development.

RESUME

To sum up the whole matter very briefly, we may put the essential points and the practical inferences concretely somewhat as follows:—

1. Habits are formed in two ways, by an intense initial reaction, which we may call shock, or by repetition.

2. Habits may be broken in two ways; first, by substituting by repetition another habit antagonistic or compensatory; second, by setting up a new habit by a single intense initial reaction, that is, by shock. In both these cases, however, it is doubtful whether the old habits are really broken up or only repressed and co-exist with the new.

3. In forming a new habit the initial reaction must be brought about by some means, either by putting the individual in a situation where the given reaction becomes inevitable, or by developing the desired reaction in connection with other familiar reactions, and then by dissociation of it from the given group of reactions, or by accident, usually by trial and error in some way.

4. In forming a new habit it is always desirable to begin with a strong initial reaction. This is what James (11, p. 123) means when he says one should launch oneself into a new habit with as strong a resolution as possible.

5. The practice of a habit should be continuous. The number of repetitions is often not as important as continuous drill. One should never allow an exception. This makes a relapse easier and interference liable to occur. This has been emphasized by James and Muensterberg. The latter writes:—

"To form habits of spelling, or grammar and style, or of observation and generalization demands the same rules as the habits of good manners at table, or of dressing, or of bicycling. In the world of ideas, too, every slip counts and every break undermines the new tendency. And in the case of mental and physical habits alike it is important to acquire them in definite forms and never to let them go on by chance. It is much easier to learn precise habits than loose ones."

6. The value of habit consists in the economy of energy that results from automatic activity. If all the more mechanical processes are given over to the lower centers then the higher centers are free for new acquisitions.

7. One should be cautious about forming habits where conditions are variable. Habit is a good thing when conditions remain the same; a dangerous thing when conditions change.

8. We have noted that if one makes, as we may say, a cross-section of the human organism at any moment, one finds habits in all stages of organization,—some incipient, some nascent, some fossilized into automatisms. We have noted further that when a habit becomes completely automatic it may combine as an element in the formation of a higher and more complex habit; thus in any acquisition of skill, in any subject of study, or the like, a hierarchy of habits may be formed.

9. Education consists in a systematic effort to form habits. It has a twofold aspect: on the one hand organization, automatization, economy, mechanism and fossilization; on the other hand, the acquisition of new habits and new forms of adaptation, the substitution of a new adaptation where an old habit has failed, or where conditions have changed. On this side education means adaptation, readjustment, growth.

New habits are formed on occasion of new stimuli. But the character of the new habit or the new mode of reaction will depend on the old modes of reaction or old habits of the individual. The new modes of reaction are assimilated to the old. The new habit is a resultant of perhaps several lower order habits.

10. In all education, especially in motor training, it is desirable that all habits formed should be propaedeutic to habits of a higher order, to those habits that must be developed later; and the value of the lower order of habits is often that they may fuse as elements in higher habits or may be broken down to make way for higher habits. The ability to break incipient habits and habits of a lower order, is a mark of sanity and a vital condition of health. In education this plasticity, if we may call it such, should be retained as far as possible.

11. Interference of motor habits or of mental associations is liable to occur in all processes of learning; and often this causes not only waste of energy but mental confusion and worry.

12. Habits of skill acquired by voluntary practice are in marked contrast with ordinary habits acquired by reaction to one's environment. Both are potentially important conditions of mental health.

13. Every habit is likely to have hygienic value, being either a habit of health or the reverse, because of the associations, conditioned reflexes, or the like, involved in it.

Thus we find that the effect of education on the neural mechanism is the stimulation of normal development; and that the hygienic conditions of habit and memory are the conditions of cerebral hygiene and cerebral function in general.

BIBLIOGRAPHY

1 Andress, J. M. The study of habit in a course in psychology (with special reference to health habits). Amer, Jour. of Sch. Hyg. 1917, Vol. 1. pp. 126-130.

2 Book, W. F. The psychology of skill. Univ. of Montana Studies. Missoula, Montana. 1908. 188 p.

3 Breed, F. S. The development of certain instincts and habits in chicks. Behavior Monographs. 1911. Vol. 1. p. 78.

4	Bryan, W. L. and Harter, Noble.	Studies on the telegraphic language. The acquisition of a hierarchy of habits. Psychological Review. 1899. Vol. 6, pp. 345-375.
5	. . . . .	Studies in the physiology and psychology of the telegraphic language. Psy. Rev. 1897. Vol. 4. pp. 27-53.
6	Cole, Lawrence W.	Adding upward and downward. Jour. of Ed. Psy. 1912. Vol. 3. pp. 83-94.
7	Dontchef-Dezeuze, M.	L'image et les réflexes conditionnels dans les travaux de Pavlov. Paris. Alcan. 1914. 176p.
8	Glaser, O. C.	The formation of habits at high speed. Jour. of Comp. Neur. and Psychology. 1910. Vol. 20. pp. 165-184.
9	Gutzmann, H.	Über Gewöhnung und Gewohnheit, Übung und Fertigkeit, und ihre Beziehungen zu Störungen der Stimme und Sprache. Fortchritte der Psychologie und ihrer Anwendungen. 1914. Vol. 2.
10	Hunter, W. S.	The interference of auditory habits in the white rat. Jour. of Animal Behavior. 1917. Vol. 7. pp. 49-65.
11	James, William.	Psychology. N. Y. Holt, 1890. 2 vols.
12	MacVannel, J. A.	Outline of a course in the philosophy of education. N. Y. Macmillan, 1912. 207p.
13	Mateer, Florence.	Child Behavior, Boston, 1917.
14	Richardson, R. F.	The learning process in the acquisition of skill. Ped. Sem. 1912. Vol. 19, pp. 376-394.
15	Rowe, S. H.	Habit formation and the science of teaching. N. Y. Longmans Green. 1909. 308p.
16	Swift, E. J.	Studies in the psychology and physiology of learning. Amer. Jour. of Psychol. 1903. Vol. 14, pp. 201-251.
17	Watson, J. B.	Animal education. Univ. of Chicago Contributions to Philosophy. 1903. Vol. 4. No. 2.

HYGIENE FOR HEALTH'S SAKE

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It must be borne in mind that the ultimate object of hygiene, as it should be taught, is not the giving of the information contained in a text book; it is not aiding children in acquiring a knowledge of physiology and anatomy, or even committing to memory the rules of health: but health itself, efficiency and happiness. If this be true, then text books and reci-

tations are but the means employed in achieving a great end—the possession and use of health. When the object to be sought is health and efficiency, it is easily seen that the emphasis in teaching should be placed on the various means of maintaining health and preventing disease, rather than on the details of anatomy and physiology.

Within the past few years the teaching of *physiology* has changed from the old, cut and dried, uninteresting text-book course, in which the emphasis was placed on morbid details of anatomy and physiology, to a course with efficiency of the human mechanism as its object, built on hygiene and sanitation, with a judicious mixture of physiology and anatomy. This change has come, not because anatomy and physiology are less important branches of study then they used to be, but because thinking people today realize that the teachings of Lister, Koch and Pasteur, founded on bacteriology, with *prevention* as their watchwords, are worth more to children than a knowledge of the histology of the bone; the chemical composition of gastric juice; the location of the thoracic duct, infundibula, and the fissue of Rolando; or the function of the pyloric sphincter and pectoralis major.

As a result of the teachings of such men as Lister, Pasteur and Koch, the world has accepted the germ theory of disease and is gradually realizing the true meaning of "*An ounce of prevention is worth a pound of cure*" and "*Cleanliness is next to godliness.*" Within recent years Harvard University, the University of Pennsylvania and Johns Hopkins University have perceived the necessity of training men to prevent disease and now grant degrees in preventive medicine. The attitude of the South in regard to sanitation and the prevention of disease was clearly shown at the meeting of the Southern Medical Association, held in Richmond in November, 1914, for throughout this entire meeting the keynote was the maintenance of health through the prevention of disease.

Even at birth if a child is endowed with good health, he must run a hygienic course which is beset with many pitfalls and snares in the form of measles, mumps, whooping cough, and a host of other ills. To help rob this path of many of its dangers is one of the duties of every teacher and especially those of physiology and hygiene. It is not to be expected that teachers shall be totally responsible for the health of their charges, for this is the duty of the parent, but the opportunity of maintaining and improving the health of the children is constantly before us, and a teacher ought to be equipped to meet and improve this opportunity of everyday occurrence. A child should be taught that he has many health obligations to perform and to this end teachers should try to impress children with the idea that health is not an individual matter alone but that each individual is but a link in a great health chain, and that the strength of the chain, the physical condition of the community, is decidedly lessened when some of its links, the individual members of society, harbor contagious diseases. In the same way that you show that measles and mumps are "catching," show that a wholesome, cheery disposition; or a sulky, chip-on-the-shoulder attitude is capable of transmission. While explaining why a boy or girl with a severe case of "sniffles" is, for the time being, an undesirable member of society, show that the fellow who can always smile is a very desirable member of society, and really a panacea for many ills.

In the teaching of hygiene we are concerned with four sciences; descriptions and locations of organs, or anatomy; functions of organs, which

is physiology; the laws of health, or hygiene; and the study of environmental conditions, or sanitation. The four studies which enter into the teaching of health are by no means of equal importance for but a superficial knowledge of anatomy and physiology is necessary to interpret the laws of health. For example, the anatomy of the teeth is important only in so far as it shows or explains the necessity of the hygiene of the teeth; a study of the muscles is important when such study bears on the necessity for exercise, but not important as a memory lesson on Latin names. Boys and girls have little use for detailed descriptions of their "innards" and usually fail to clarify or classify the information given them concerning the vital organs. Most children, girls in particular, evidence little interest in "bounding" the various organs of the body, but most of them do show some interest in maintaining their bodily organs in a state of health.

In directing the teaching of health away from anatomy and physiology, I am aware that both of the above named sciences have played, and are still playing, an important rôle in the promotion of health and the prevention of disease. I realize the necessity of both in the training of doctors, trained nurses and even teachers—but this is no reason why their details, meaningless to boys and girls, should be crammed down their throats.

To teach the various lessons of sanitation it is necessary that much streess should be laid on bacteriology, not as a science, but as it is related to the spread and prevention of disease. Here I should like to wave the red flag of warning for the benefit of those who are inclined to harp on the subject of germs to such an extent that "germitis"—that attitude of mind which prevails among those people who lose much of the pleasure of life for fear of coming into contact with germs—spreads among the students, and children become hypochondriacs. Not long since a case came to my attention of a boy who was leading a miserable life and fast becoming a nervous wreck, due to the distorted idea which he had gotten from the study of germs and their influence on health. He was afraid to drink water or milk, afraid of the meats and poultry bought in the stores, afraid that his food had been polluted by flies—in short he could eat nothing in peace. If the study of germs is approached from the biological standpoint and germs are looked upon as "the invisible" *friends* and foes of man, and the idea that bacteria or germs *may* exist practically anywhere, but are not always everywhere, there is little chance that children are going to think that every time they take a breath of air they are taking a chance between life and death. In the teaching of hygiene it is well to show that, if the environment is free of germs, there can be no disease in the body. To teach children to "abhor insanitary surroundings is an important duty of hygiene, because sanitation kills germs and keeps the body strong enough to throw off most diseases before they gain a foothold in the body." Much of the information of preventive medicine can be learned from the publications of the State Board of Health, which are distributed free of charge and should be in every school of the State.

It is quite possible and highly profitable to make demonstrations in class. A teacher can get enough information from many of the modern texts on hygiene or the little books on first aid to the injured to instruct children in the methods of resuscitating, binding of wounds, testing

capacity of lungs, and carrying guns in such a fashion that accidents will be prevented.

There are many old sayings which may help us in fixing in the minds of pupils some of the vital factors of health and some which we ought to forget. "Stuff a cold and starve a fever" is one of those "pithy sayings," the verp pith of which may be poison. "When the wind blows through a hole, make your will and mend your soul" has lost its force. But "an ounce of prevention is worth a pound of cure" and "cleanliness is next to godliness" are just as true today as when they were first stated. Again I ask you to remember that it is more important for children to clean their teeth than to know how many they possess; that deep breathing is better than a knowledge of carbon dioxide; that an open window is worth more than a lesson on ventilation, and that the teachings of physiology and hygiene are negative when their principles are not carried out by the teacher in the class-room.

Let us live up to the opportunities which our profession affords; scrape out the enlarged tonsils, cut out the adenoids, quarantine the diseased, straighten the crooked spines, brace up the stooped shoulders, and show positively that "health is wealth."

PUBLICATIONS RECEIVED

THE PEOPLE'S HEALTH, by Walter Moore Coleman. N. Y., The Macmillan Co., 1913. 307 pp. ill.

In this excellent book the writer has attempted a new task. He has tried to reduce our more recently developed public health measures to a simple code, understandable by pupils and brief enough to be managed in a single school course. In an age when individualism has become rampant, the discoveries in sanitation have shown that selfishness and indifference to others in matters of health is suicidal. The school prepares a pupil for his place in a social community. The material is so arranged that the pupil is actually stimulated to do a little civic thinking for himself—a thing unusual in most of the textbooks in personal and community hygiene that have thus far been published. It appears to us that no better basis for the teaching of the duties of citizenship, of which we are hearing so much in these days, could be found than that afforded by hygiene, and certainly we know of no book which could better serve as a suggestive background for this sort of training than *The People's Health*. It is very readable; lacking in needless technicalities, yet always scientific; well illustrated and carefully arranged. The sections dealing with *Mental Hygiene, School Sanitation, The Public Health Department, Rural Sanitation* and *Industrial Hygiene* are eminently suited for the comprehension of boys and girls, and are rich in the suggestion of local observation and field work.

A MANUAL OF PERSONAL HYGIENE, edited by Walter L. Pyle, M. D., Philadelphia. Seventh edition, revised and enlarged. 555 pp. 138 ill. Philadelphia and London, W. B. Saunders Co., 1917.

This classic work remains practically as it appeared in the 1916 edition, a few paragraphs having been added here and there. The size of the volume is increased by only 12 pages.

THE ILLINOIS SURVEY, L. D. Coffman, *Director*. Published by *The Illinois State Teachers' Association*, 1917. 377 pp.

A co-operative investigation of school conditions and school efficiency, initiated and conducted by the teachers of Illinois in response to a resolution passed by the Association in December, 1913. The titles of chapters and the names of the several investigators follow: *The Economic Status of Teachers in Illinois*, by L. D. Coffman; *Program of Studies in Town and City Graded Elementary Schools*, by W. C. Bagley; *The Technique of Superintendence*, by L. D. Coffman; *School Finances*, by David Felmley; *Student Population and Related Problems in High Schools*, by J. A. Clement; *Spelling Scores for Fifty-four Illinois Cities*, by J. F. Babbitt; *Arithmetic Scores in Seven Illinois Cities*, by J. F. Babbitt; *Some Exceptional High School Pupils in Illinois*, by E. E. Jones; three reports on *Rural Schools* by Caroline Grote, of McComb Normal School; Edgar Packard, of State Normal University, Normal, Ill.; and Joseph H. Hill, ex-president, Emporia (Kan.) Normal School.

The value of this work is very limited, and one wonders whether, in its present form, it should be called a "survey" at all. In fact nearly every contributor starts out by apologizing for the pages he is about to write. To be a real survey of the schools of the great state of Illinois not only must a far greater amount of data be available, but a much wider scope must be embraced. We note, however, that the surveyors themselves appreciate the limitations of their report, necessitated "by lack of funds, and the failure of certain agencies to co-operate with the movement and by the unfriendly attitude of certain members of the teaching force." As it stands, the report flashes a great number of interesting sidelights upon various phases of education in Illinois, without however affording any real basis for comparative study.

THE INTERNATIONAL HEALTH BOARD, *of the Rockefeller Foundation*. Third annual report. January 1, 1916—December 31, 1916. 61 Broadway, N. Y. By Wickliffe Rose, *Director General*. 246 pp.

During the year the work of the Board continued to be directed chiefly toward the relief and control of hookworm disease. Systematic efforts toward control have now been inaugurated in eight of the Southern states and in fifteen foreign countries. New fields of operation in 1916 were Salvador, Brazil, Ceylon and Siam. The report takes the form of a detailed account of the experiments and achievements of the Board.

MENTAL HEALTH for NORMAL CHILDREN, by William H. Burnham, President of the *Massachusetts Society for Mental Hygiene*. Published by the *Society*, 1132 Kimball Bldg., Boston, Mass. 7 pp.

An enumeration and brief discussion of the seven cardinal principles of mental hygiene as operative in school instruction and discipline. The child should have (1) normal habits of reaction to his impulses and feelings; (2) many interests and the power of self-control furnished by them; (3) ability to concentrate attention on the present task; (4) habits of orderly association; (5) an active attitude in the face of difficulty; (6) a steadfast purpose for service and co-operation; and (7) a sense of dependence and unsullied honor.

ILLINOIS HEALTH NEWS, the official *Bulletin* of the *State Department of Public Health*. Vol. III, No. 7, N. S. 20 pp.

Contains, among other interesting papers and comments, a very good, though brief, article on *Rural Sanitation*, contributed by Mark J. White, a surgeon in the U. S. Public Health Service.

FOOD FOR THE FAMILY, Publication No. 120, Bureau of Home Economics, *N. Y. Association for Improving the Condition of the Poor*. 1917. 15 pp. 5 cents per copy.

The aim of this leaflet is to suggest such meals as will be best for growing children. Parents and directors of school lunches should find some very suggestive reading in this little pamphlet.

THE ADEQUACY AND ECONOMY OF SOME CITY DIETARIES, Publication No. 121, Bureau of Food Supply, N. Y. A. I. C. P. Prepared by H. C. Sherman, Columbia University, and L. H. Gillett, of the Association. 32 pp. ill. 25 cents per copy.

A study of 92 family dietaries made in New York City, Cleveland, Long Beach and Stamford (Conn.) Each dietary is an exact record of the amount and cost of the food eaten by a family for a period of seven days, together with a discussion as to food values in each case.

THE SCHOOL MEDICAL EXAMINER, published by the Board of Education, Nashville, Tenn. Vol. 2, No. 2. 4 pp.

The object of this interesting little folder is "to bring about the best possible co-operation between the parents and the Medical Inspection Department of Nashville." An interesting commentary upon the work of school medical inspection is afforded in the following letter written by a mother to the school nurse in consequence of the latter's advising her to have professional attention given to her child's throat:

"Miss ———: i have not had ——— treated he seaid his throat dont heart and i aint a going to have his tonsel tuck out. "Your friend, Mrs. ———."

HYGIENE AS NATURE STUDY, by F. M. Gregg, Peru State Normal School, Peru, Nebraska. Published by the author.

A prospectus of a series of inductive-deductive lessons in hygiene for grades V, VI, VII and VIII. The book contains 9 chapters: (1) *School Sanitation;* (2) *Pedagogy of Hygiene;* (3) *Work of Grades I-IV;* (4) *Habit Hygiene;* (5) *Germ Hygiene;* (6) *Community Hygiene;* (7) *Human Body Hygiene;* (8) *Etchings for Blackboard;* (9) *Appendices.*

FOOD ALLOWANCES FOR HEALTHY CHILDREN, Publication No. 115, *Bureau of Food Supply*, N. Y. A. I. C. P. Prepared by Lucy H. Gillett. 1917. 24 pp. 10 cents per copy.

This digest summarizes in convenient form the net results of modern research upon the energy expenditure or total food requirements of children of all ages and of both sexes.

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IMPROVEMENT OF HEALTH CONDITIONS IN THE RURAL SCHOOLS OF MAINE

BY HAROLD A. ALLAN

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Recently I was in conversation with a wide-awake farmer. We were discussing school affairs in general and the one-teacher school of his neighborhood in particular.

"Yes," he said, "Miss A... is a good instructor but, do you know, I have made up my mind that a good instructor is not the only essential of a good school. I have a six-year-old boy who has entered school this term for the first time. Could I only see ahead and select the conditions under which he would attend, what a blessing it would be!

"Suppose," he continued, "I could have my choice of two things: His attendance in a school with unfavorable physical conditions but under the charge of a teacher with unusual ability as an instructor or in a school, sanitary and wholesome in all particulars, under the direction of a teacher of mediocre ability. Under the first condition I might reasonably suppose that my boy would make excellent progress in his lessons—perhaps to the extent of being prepared to enter high school a year or two earlier than when directed by the less skilful teacher. But such progress would have no attraction to me should I realize that his surroundings were such that his condition of health and future comfort of body were menaced. First of all give us the right kind of physical conditions. Make the schoolhouse sanitary and attractive and the retention of the skilful teacher is made easy and the progress of the boys and girls is assured."

And the encouraging thing which I gather from this statement is that here and there—all about the State of Maine—are parents, citizens and teachers who hold the sane opinion that a good schoolhouse is an essential requirement of a good school.

Health conditions in the schools of Maine are probably not unlike those of other eastern states. While no specific figures for the state are available there is little doubt that health conditions of children in the rural communities are less favorable than those of children in the cities and large towns. The organizations and more definite plans for better physical conditions, as existing in some of the large communities for some time past, have accomplished far more than can be brought about by a dependence solely on the advantages of the natural environment. The tonic of the fresh, untainted air of the country could do much for the boy—were it always available to him. But his schoolroom and his home often have no means of ventilation and the windows of his sleeping room may be seldom opened. In many communities no thought has been given to his physical welfare. The problem therefore primarily is rural. The awakening of the rural communities and a campaign for better phy-

sical conditions in the school and in the home are the pressing demands.

Efforts for such improvements are being made under the following heads:

A. Through legislation that provides for a stronger organization of school administration, an increased state control of improvement in buildings, optional medical inspection and compulsory examination of the sight and hearing of pupils in public schools.

B. Through education of the communities on the necessities of decent housing conditions.

C. Through instruction to teachers, superintendents, and committee members on improvement of existing school conditions and on the detection and reporting of pupils in ill health.

The Maine Legislature of 1917 made provision for state-wide professional supervision of schools. By this action full time, intelligent direction of schools is insured to all communities of the state, regardless of their size. Through the body of superintendents thus employed and paid in part from state funds cooperation in all efforts for school improvement becomes more certain.

The same legislature also made recognition of a demand for increased activity on the part of the State Board of Health and made provision for the reorganization of that department. This reorganization allows the employment of workers in the field and closer investigation of conditions dangerous to health.

The statutes provide that all plans for new school buildings and plans for remodeled or reconstructed buildings shall receive the approval of the State Superintendent of Schools and the Commissioner of Health. This provision of the law has done much for the improvement of housing conditions. Assurance is thus given that new buildings and reconstructed buildings shall conform with modern standards of hygienic arrangement. The following elementary standards to be observed have been adopted:

1. Location—on high ground, at a suitable distance from low marshy ground, railroads, manufacturing plants, barns or other sources of noise, smoke, dust or odors.

2. Schoolrooms—preferably of dimensions in proportion of length to width as four to three. Ceiling at least 12 ft. high. Floor space at least 18 square feet per pupil in classrooms and air space at least 215 cubic feet per pupil.

3. Lighting—from windows in wall at left of pupils (or in walls at left and rear of pupils in rooms of exceptional width.) Glass surface at least one-fifth of floor surface. Principal light to be received from the east or west. Windows to extend to at least one foot from the ceiling.

4. Heating and Ventilation—Heating by direct radiation alone from stoves or steam coils will not be approved. Jacketed stoves, ventilating heaters, furnaces and steam, hot water, or vapor heating plants must be capable of heating 1800 cubic feet of fresh air per pupil per hour.

5. Toilet arrangements—Water closets or chemical closets to be in school building or building attached. Privies to be connected with school building by passageway with lattice or slat work sides. Passageway at least 10 ft. in length. Vaults to be ventilated, fly proof, and easily cleaned. Covers to be provided for seats. Double seat or urinal in boys' closet.

Under the terms of the law the State Superintendent of Schools furnishes to building committees model plans and specifications for build-

ings of four rooms and less. Construction is undertaken often directly from these plans. Help is also given from the State Department of Education in the preparation of sketches proposing changes that may be made.

Towns having excessive rates of taxation for the support of schools receive special state aid out of the Equalization fund, so called. The money paid from this fund must be used as recommended by the State Superintendent of Schools. In the year 1916 the total apportionments amounted to $47,370. Of this amount nearly twenty-five percent was used for improvement of physical conditions as follows:

Improvement of school grounds.....	$475
Heating and ventilating.....	1,142
Improvement of sanitary conditions....	1,940
Purchase of permanent equipment.....	3,325
General school building improvement...	4,463

When it is considered that this money was paid almost entirely to small towns remotely situated and that in many cases additional amounts for like purposes were appropriated by the towns the direct improvements thus accomplished and the emphasis of the importance of such improvements to the community may be measured.

Through the operation of the law which permits the employment of school physicians much good has been accomplished although the number of towns taking advantage of its terms is disappointingly small. Forty-one towns report the employment of school physicians. The time will soon be at hand for a mandatory medical inspection act. Through a plan for the union of towns for the employment of school physicians such a demand is practicable.

The present medical inspection law requires an annual examination of the sight and hearing of all public school pupils. Material for such an examination and for the records and reports thereon is furnished to the towns by the state without expense. Some difficulty is experienced in securing the satisfactory administration of this law and in the following-up by school officers of the information obtained. For the year 1916 examinations were given to 114,471 pupils (86 per cent of the elementary school enrollment); 11,031 (10 per cent) were reported defective in vision and 3,508 (3 per cent) defective in hearing.

Legislation cannot be successful if too far in advance of public opinion. The creation of community interest in better physical conditions in the schools becomes the greatest necessity.

The problem of the one-room school supported by a community lacking in prosperity is most difficult. While exponents of consolidation have most of the arguments in their favor the fact remains that in many sections of Maine the one-room—or better—the one-teacher school is a permanent establishment and must be encouraged rather than allowed to decay.

Recently a summary was made of some of the more significant figures relating to physical conditions in the one-room schools of the state. The reports on which these figures are based are from a sufficiently large number of schools and towns to be representative of state-wide conditions.

CONDITIONS IN ONE-ROOM SCHOOL BUILDINGS

Reports from 1438 schools (61%) in 280 towns (54%).

General

Number of one-room buildings, 1916	2353	
Number of one-room buildings, 1906	2667	
Decrease in number in use	314	(12%)
New buildings constructed in 10 years in towns reporting (65 towns)	108	
Number passing out of use (at least)	422	

State of Repair

In good condition	1147	(80%)
In poor condition	291	(20%)

144 towns in which *all* are in good repair.
14 towns in which *all* are in poor repair.

Lighting

In approved manner (from left side)	14	(1%)
In approved manner (from left and rear)	96	(6½%)
From left, rear and right	576	(40%)
From left and right	396	(27½%)
From four sides	258	(18%)
Other combinations	98	(6½%)
Buildings excluded in above with windows in front	349	(26%)
Buildings reported with adequate light surface	992	(62%)
(58 towns in which no buildings have adequate light.)		
With window shades	1254	(87%)
(32 towns in which no schools are so equipped.)		

Heating and Ventilation

By jacketed stoves or ventilating heaters	162	(11%)
(In 73 towns)		
With other means of ventilation than windows	181	(12%)

Wardrobes and Closets

Well arranged wardrobes	691	(47%)
(120 towns without a school so equipped)		
Closets for books and supplies	1085	(75%)
(42 towns without a school so equipped)		

Blackboards

In good condition	687	(46%)
Of satisfactory area	995	(69%)

(Probably does not include proper placement—50 towns without a school having blackboards in good condition.)

Seats and Desks

Modern single (no attempt to get figures on adjustable or stationary) 624 (42%)
(87 towns without a school so equipped)
Double seats and desks..... 652 (44%)
(In 205 towns—only 75 without them)
Old type benches..... 181 (13%)
(In 72 towns)

Drinking arrangement

Covered vessel with bubbler or faucet..... 745 (52%)
(92 towns with no schools so equipped)
Covered vessel with long-handled dipper..... 186 (13%)
An open pail or dish..... 421 (29%)
(In 108 towns)

Outbuildings

In good repair..... 891 (62%)
(None in good repair in 77 towns)
In unsatisfactory condition..... 471 (33%)
(In 148 towns—132 having all outbuildings satisfactory)
Clean and free from markings..... 683 (46%)
(54% not so clean—91 towns without one clean)
Connected with schoolroom by well ventilated passageway 202 (14%)
(In 81 towns—7 towns entirely so equipped)
Unattached and separated from building.....1127 (79%)
Arranged with separate apartments for sexes.....1182 (82%)
(18% single apartment toilets—21 towns with that type only)

School Grounds

Of ample size..... 889 (62%)
(64 towns having no schools so equipped)

Comment on these figures is unnecessary. That many communities have awakened to a sense of realization of the unfitness of their school building for the purpose which it attempts to serve is very clear. Throughout the State organized efforts—"programs for improvement"—are being made for better schoolhouses and a like summary made a few years hence will undoubtedly show far different proportions.

A popular "program for improvement" includes a plan for placing at least one building each year in standard condition through a special appropriation of the town sufficient to make all essential repairs and include rearrangement of lighting, heating and ventilation and sanitary conditions. Other "programs" include the improvement of at least one feature in all the schools or a group of schools each year. The first method is usually most successful. Good judgment is required in the selection of the building first to be remodeled with consideration as to the permanency of its use and its location. The tax payers also must be shown definitely the advantages received from the money expended. One

building in a town, of modern arrangement and with modern equipment, will do much toward bringing about the same conditions in other schools.

Special emphasis is being placed on arousing the community interest in improvement of ventilation and outbuilding conditions. The installation of standard ventilating heaters is encouraged. Where the cost of these is prohibitive a simple plan for converting the ordinary "box stove" into a ventilating heater is described. This is done by means of a galvanized iron jacket surrounding the stove, with fresh air intake and foul air vent to the chimney. Working plans for this device may be secured from the state school department and its slight expense places it within the reach of any town.

Having in mind the protection of the morals as well as the health of school children the department advocates that the outbuilding shall be connected with the school building by a covered walk so arranged as to allow free circulation of air between the schoolroom and the outbuilding. This is easily secured by constructing the sides of the walk of lattice work or shutter work and by arranging the separating partition of the walk so as to allow circulation overhead. Such an outbuilding may be entered only through the schoolroom and is under the constant supervision of the teacher. Within the past two years the writer has visited over fifty outbuildings so arranged and has yet to find a case where defacements have been made. When the passageway is well ventilated and at least ten feet in length no evidences of odors in the schoolroom have been detected. The construction of ventilated pits made as nearly fly proof as possible is required.

Chemical closets are being used to a limited extent with generally satisfactory results. It is necessary to impress on all who have the responsibility for the condition of closets that whether flush closets, chemical closets or privies are in use constant care is essential to insure conditions of cleanliness.

Emphasis on particular essentials of improvement is doing more to awaken community interest than generalities. Whenever it is possible to do so information is given about the conditions in "*your* school" and their effect on "*your* boys and girls."

To teachers, superintendents and committee members is being carried a definite campaign on the improvement of health conditions. Instruction is being given at summer schools, institutes, local teachers' meetings and conferences. Such instruction is along the general lines of ideals in building arrangement and health instruction. Encouragement is given to teachers in their efforts to detect and report diseases of school children. Taking advantage of the results of the sight and hearing tests is also encouraged. Teachers are making special efforts to give to the boy or girl defective in sight or hearing a place in the schoolroom where these defects will be of the least disadvantage.

Emphasis is placed on the responsibility of teachers and school officers for cleanliness of the school and its surroundings. Simple suggestions for homemade sweeping compounds and the like are given.

Cleanliness of the drinking arrangement is required and where a bubbler fountain cannot be secured a vessel with a faucet is recommended. A pail of good quality in which a faucet has been inserted proves a good container of the water supply inasmuch as it is likely to be rinsed at least when taken to the source of supply for filling. Individual cups are re-

quired by law and suggestions are made for their proper care and protection in the schoolroom.

The dangers of the fly nuisance are made clear and suggestions for screening the schoolroom and the outbuilding are given. A community made aware of conditions in the schoolroom during a warm September afternoon will often supply the screening material.

The importance of frequently flushing out the unventilated room is made clear. A plan for ventilation by means of screens of unbleached cotton cloth is described.

The adjustment of seats to fit the pupils and the supplying of foot rests for those too small for the seats is explained. The matter of selection of seats in which the most desirable light may be secured is called to the attention of the teacher and she is urged to experiment in the matter of blackboards receiving the best light.

The adjustment of window shades so that the light may be secured from the most desirable directions and cut off from windows in front of the room is carefully explained. Equipment with shades fastened to the lower part of the windows is urged.

Suggestions are offered for the better care of the outer clothing of the children and the avoidance of their exposure to colds by putting on clothing that has been hung in an entry open to the weather. Even one-room buildings are generally so arranged that one entry may be used for a cloakroom by permanently closing the outside door and allowing it to be warmed from the schoolroom. A hook for every child is demanded and some system to avoid the too close contact of the clothing.

Through the work of the School Improvement League many improvements have been made. The League is responsible for the warm noon lunch in many schools. Through attendance at its meetings the patrons become acquainted with existing conditions and are led to revolt at them.

A visitation of Maine schools will show many improvements in physical surroundings and with these improvements vastly better schools. Poor physical conditions, weak teaching, irregular attendance and unsatisfactory progress are closely linked. A successful effort for healthful surroundings naturally brings with it a school healthy in all other respects.

MEDICAL INSPECTION IN NEW HAMPSHIRE

By Henry C. Morrison

State Superintendent of Public Instruction for New Hampshire.

The Medical Inspection Act became a law in the early part of 1913.

The Act provides that one or more school physicians shall be appointed and assigned to each public and each private school by the school board and that the school board shall provide them with all proper facilities for the performance of their duties. At least one examination of all pupils, teachers, janitors, and other employees, in each year is required. In case the teacher suspects ill health in a child or a communicable disease, it is

required by the Act that the teacher shall report the circumstances to the parents and, if the parents fail to take action, she can report it to the school physician. The school physician may then exclude the child, if he finds the child to be suffering from a communicable disease. Tests of sight and hearing are required to be made by the teacher under the direction of the school physician. The directions for administration of the Act are prescribed by the State Board of Health, and the State Education Office prescribes instruction, test cards, blanks, record books and other useful appliances for carrying out the purposes of the Act. Pupils may be exempt from examination upon the request of parent or guardian, filed in writing with the teacher.

The Act is permissive rather than mandatory and when adopted by town or city school district becomes operative within that district. Thus far, 61 of a total of 257 school districts have adopted the Act. In two cases, the district has subsequently repealed its action.

Complete blank forms for use in the administration of the Act are uniform throughout the state and are prescribed by the Superintendent of Public Instruction, with the approval of the State Board of Health. Reports are required to be made by the school physician to the local superintendent of schools and the local superintendent is required to make an annual summarized report to the State Superintendent.

In a few cases, school nurses have been provided for in connection with medical inspection and in about a dozen communities dental inspection and a dental clinic have been instituted.

As might readily be expected from the non-mandatory and loose administrative provisions of the Act, efficiency varies all the way from those communities in which it is high to those in which inspection is little more than a farce,—and occasonally worse than a farce. In those towns in which the work is well done, the results have been immediate and gratifying. They appear as the saving of numerous children from troublesome and possibly serious diseases, as the remedying of physical defects, such as bad teeth and defective vision and hearing, and as a general improvement in schoolroom work by reason of the removal of hampering physical conditions in individual pupils. One of the notable achievements has been in the town of Claremont where the work has been fully reported by Dr. R. H. Brooks, the medical officer in charge. See N. H. Department of Public Instruction, Circular No. 63.

The provision of the Act which exempts children from examination upon the request of the parents has had apparently little significance, except that very likely some parents knowing that they might prohibit examination, if they chose, have been content not to do so.

Generally speaking, public sentiment is distinctly favorable toward the principle of medical inspection.

It is noteworthy that the original adoption in a district and subsequent success of medical inspection has depended very largely upon the interest and good will of the medical faculty in the community. Towns have been slow to appropriate sufficient sums to make it financially worth most physicians' while to undertake the duties. True, in not a few cases, this has operated to attract the services of inferior members of the profession and, in one or two cases which have come to light, the results have been harmful. Occasionally, especially in the smaller places, the two or three physicians serving a region have found it so far impossible to agree as to make the project a failure.

Four years of experience in the administration of the Act have made it clear that certain things should be done, if the state really wishes the health of its school children protected and their physical well-being cared for.

I. The Act should be universal and applicable throughout the state. The well-being and, very possibly, the lives of children ought not to be subject to the neglect or, very possibly, the caprice of the local town or city school district. If the lawmaking body is convinced that a permissive act is called for, the matter is of such vital importance that it is clear that all the arguments which support a permissive act support with still greater force a universal mandatory act.

II. I have found no objection here to the principle that the medical inspector should be appointed by the school authorities. So far as is known to the writer, the health authorities and physicians quite generally prefer that it should be this way. There should, however, be attached to the State Education office an inspectorial officer of medical training whose duty it should be to see that the Act is properly observed throughout the state and he should be armed with the necessary legal powers to that end.

III. The follow-up work is quite as necessary as inspection. Except in a very few communities, which have employed a school nurse, little or no follow-up work is done. In others, some unsystematic follow-up is carried on through the agency of interested teachers. In the opinion of the writer, such work should be universal and as much a part of the system as the inspection itself. It is work which calls, particularly, for a well trained nurse who has had some training and a great deal of natural aptitude for social welfare work.

IV. The compensation paid both for inspection and follow-up work should be sufficient to make it possible for competent trained persons to enter upon this part of school work as a profession and a life work. It is trivial to plead that the community cannot afford it. This state does not ordinarily rank as a wealthy state but there is no sound financial reason whatever why all the cities and larger towns should not each have one or more medical inspectors, well paid, with nurses, well paid. If people really wish to have the work done and have it done well, it is a simple enough matter to find the money to do it. The agitation for medical inspection should not be satisfied with the mere adoption of the vote and provisions for going through the motions. It should go farther than that and show the citizens what is really needed. The timid promoter whose whole argument is, "Let us make a start now, even if it is a small one, and we shall have more money bye and bye," is oftentimes the worst enemy of this and related social welfare work. It ordinarily happens that if you don't get money enough to do a fairly good job from the start, you're likely never to get it.

In the smaller country towns, the whole history of supervision of schools in New England has shown that towns can be grouped together for this and for other similar work and good salaries paid. The average salary paid to country superintendents of schools in this state at the present time is well over two thousand dollars per year.

V. In every community where medical inspection with its attendant follow-up work and, if possible, dental clinics exist, there should be the closest systematic relation between this work and constructive attendance work. It would be well in most instances to give the school nurse attendance officer powers.

There never was a better time for those of us who believe that the future of society is bound up in the children to urge a long step forward in the protection of the physical well-being of children. The country is receiving at the present time an object lesson of stupendous proportions in the social necessity of clean, healthy individuals, who are well, physically strong, and who know how to keep so. The lesson ought to bear fruit in a wide extension of medical inspection of school children and of well organized follow-up work, and the time is ripe to make it competent and efficient and universal.

A RESUME OF A TIMELY CONTRIBUTION TO HYGIENE

BY LAWRENCE AUGUSTUS AVERILL

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One of the most recent as well as significant contributions to the subject of hygiene is a 210-page work, entitled *Hygiene and War,* compiled by George Ellis Jones, Ph. D., Assistant Professor of Educational Psychology in the University of Pittsburgh, and published,* under the general editorship of Professor Paul Monroe, by the Division of Intercourse and Education of the Carnegie Endowment for International Peace. About one-sixth of the bulletin is in the form of *An Introductory Statement,* by William Henry Burnham, Ph. D., Professor of Pedagogy and School Hygiene in Clark University.

The chief purpose of this bulletin is, in the words of the editor, "to present to the school children of the United States materials showing the futility and burden of militarism and the destructiveness and barbarism of modern war, or materials relating to the heroism and patriotic services of deeds of everyday life." The accomplishment of this purpose is sought through two means:—

> *First,* it is hoped to interest text-book writers in the feasibility and desirability of incorporating some of the materials published in this pamphlet, or materials of a similar nature suggested by them, in the text-books to be written for our schools.
>
> *Second,* awaiting such more or less remote results, it is sought to place in the hands of the teachers of the special subjects in the schools the appropriate pamphlets that they may use them in their regular class instruction. There is no desire to deny the heroism called for by war or the necessity of the patriotism and the sacrifices demanded by war. Yet it is hoped to develop a broad and tolerant conception of patriotism and higher idealism through the incorporation of the matter suggested into the materials of instruction.

It is the purpose of this résumé merely to make mention of some of the more important conclusions reached by Professors Jones and Burnham.

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*Publication No. 11, Washington, D. C., 1917.

Obviously a study of the nature of *Hygiene and War* contains much of a general hygiene nature which, although extremely valuable and opportune in the present crisis, has no direct relationship to school and child hygiene. We shall therefore endeavor to summarize only those findings of the investigators that are of immediate significance for the hygiene of the child.

PROFESSOR BURNHAM

The general effects of war on hygiene are three-fold: (1) War emphasizes certain essential hygiene truths, such as, for example, the fact that those trained in habits of health and cleanliness have a great advantage in war; that after all the requirements for a good recruit do not differ materially from those for a good businessman or a good workman; and that a vast war literature bearing more or less upon health has been produced. (2) War contributes to hygiene by stimulating the discovery of many important sanitary measures and methods. Attention is called earnestly to a consideration of food values and alcoholic beverages; discoveries of many important hygienic truths are favored by the conditions and the necessities of camp life. Notwithstanding the stimulus given to hygiene by war, however, peace and the laboratory have proven in times past for more favorable to real advancement along these lines. (3) War is actually detrimental to the cause of hygiene in that it enforces a serious setback to the battle which hygiene is constantly waging against the enemies of man's health. Mr. Ealand in his new book, *Insects and Man,* goes so far as to say that the outcome of man's perennial conflict with the arthropod is nearly as much in doubt as is the result of the present European confiict,* and yet in the face of this the world has allowed itself to turn aside from the pursuance of the battle, and the enemy, taking advantage of a division of forces among his opponents, is making great inroads all along the line of the war in Europe. The insect-destroying birds have been frightened away from France and Belgium by the artillery; soldier and citizen alike have felt that they could not take the time for important hygienic measures which would have otherwise been observed; the money and equipment otherwise available have been turned aside to meet the exigencies of the more imminent war; physicians and nurses have been called to the front; home and school sanitation are consequently neglected at a time when the need is greater than ever before. Again, the progress of hygiene after the war will be retarded by the burden of a vast number of cripples, invalids, consequent poor housing and poverty; by the probable migration into this country of hundreds of thousands of Europeans who must in some way find relief from heavy taxes; by the inception into this country of many and perhaps new infectious diseases; and by many other problems with which our departments of health and hygiene must ultimately cope.

As to military preparations for war, four things are essential: (1) a good physique and hygienic personal habits in the individual soldier; (2) ability of the soldier to coöperate and obey orders; (3) ability of a country to support itself; and (4) adequate military preparedness, including the ability to manufacture the necessary munitions of war. All

*The materials of this pamphlet were collected a year or more ago, and therefore considerably before our own entry into the war.

but the last of these are obviously essential to the welfare of any country quite as much in times of peace as in times of war. For all the crises of life the only preparedness of prime worth is a moral preparedness. Military preparedness is after all a misnomer, for adequate military preparedness over a considerable period is practically impossible. "As soon as a dreadnought is built it begins to deteriorate. As soon as a submarine is built a better form is invented. As soon as a superior form of armor is derived a more powerful explosive is invented."

As a more logical type of preparedness, Professor Burnham would suggest as one of the best outlets for the fighting-instinct in man and as a natural substitute for war the enlisting of all school children in a life-long war against disease. In so-doing, the teacher will not only be appealing to a fundamental instinct and directing it into a humanitarian channel, but she will also be stimulating both a moral and a physical preparedness which will stand the citizen of the future in good stead whenever the great crisis of life come. In the words of the writer:—

> As one of the best outlets for the so-called fighting instinct and a natural substitute for war, the writer would suggest enlistment in the warfare against the disease-carrying insects, as well as the greater development of the hygienic side of the soldier's training.
>
> While this hygienic warfare is not so spectacular and does not at first appeal so strongly to the youth as military warfare, it would not be difficult for tactful teachers to stimulate an interest in this conflict. Not merely can the importance and practical utility of it all be shown to the young, but it would even not be without appeal to the instincts of chivalry and romance. That it gives opportunity for protecting one's friends from sickness and death, that it is service of the most significant sort for women and children and the weak and defective, make such warfare appeal even to the higher altruistic instincts. . . . . .
>
> The warfare against disease gives opportunity for appeal to the same fundamental instincts. If at present such occupation seems vapid and dull, it is because it is judged from the outside, where as yet there is no beating of drums, no manual of drill, no organized hierarchy of grades, no insignia of rank, no official rewards, and the like. But those who have actually done work of this kind, who have actually engaged in this warfare against disease, have found the same or higher interests and rewards. Even the incidentals of occasional opportunity to encounter danger and to use one's wits in invention and strategy, as well as opportunities for sacrifice and devotion, are not lacking. Those who enter the service acquire the interest. . . . . .
>
> As regards hygiene the plain facts strangely ignored are these. Mankind, engaged in a continual life-and-death struggle with disease-carrying organisms, was making noteworthy progress, especially in the cities of Europe and America. A great victory was achieved in Havana and Panama and the key to the conquest of the tropics was acquired. Then the nations withdrew from the common enemy and began to fight among themselves, spending in two years an amount of money sufficient practically to eliminate malaria, yellow fever, and other tropical diseases from the more densely populated tropical centers. The fighting impulse that should find legitimate expression in physical training, in sport, and in fighting our common disease-bearing enemies, is turned to man's butchery of man. The neutral nations, aroused to the need of preparedness, are largely forgetting the prime condition of preparedness for both peace and war, namely, physical health and training in personal hygiene.

PROFESSOR JONES

The main body of the work, that compiled by Professor Jones, is divided into six sections, as follows:—

I. *Introduction.*
II. *Destructiveness of War Through Diseases and Wounds.*
III. *Economic Results of War.*
IV. *The Civilian Population and War.*
V. *The Elimination of the Most Fit.*
VI. *Benefits to the General Population if:* (a) it should follow as efficiently as soldiers the training and care the latter have in hygiene; and (b) the efforts now expended upon soldiers alone were expended upon the general public.

To summarize some of the conclusions reached under each caption:—

I. *Introduction.* Professor Jones at the very outset charges war with inadequacy in attaining the purpose for which it is started or supposed to be waged—that is, as an economic adjuster, as a promoter of ethics, and as a developer of the race. He concludes also that "*the health and strength of the general population is the greatest preparedness of the nation, not armor, ships, etc.*" In substantiation of this position he quotes freely from the report of that first real attempt to study the effects of war from a thoroughly unbiased and scientific viewpoint, namely The International Commission of Inquiry into the Balkan Wars, in which he finds ample proof. For instance, we read:

> On a close view of what happened in Macedonia, as the Balkan armies marched southward, this War of Liberation assumes a more sordid and familiar aspect. It unleashed the accumulated hatreds, the inhereited revenges of centuries. It made the oppressed Christians for several months the masters and judges of their Moslem overlords. It gave the opportunity of vengeance to every peasant who cherished a grudge against a harsh landlord or a brutal neighbor. Every Bulgarian village in northern Macedonia had its memory of sufferings and wrongs. For a generation the insurgent organization had been busy and the normal condition of these villages had been one of intermittent revolt. The inevitable Turkish reprisals had fallen now on one village and now on another. Search for arms, beatings, tortures, wholesale arrests, and occasional massacres were the price which these peasants paid for their incessant struggle toward self-government. In all these incidents of repression, the local Moslems had played their part, marching behind the Turkish troops as *bashi-bazouks* and joining in their work of pillage and slaughter. Their record was not forgotten when the Bulgarian victories brought the chance for revenge. To the hatred of the races there was added the resentment of the peasantry against the overlords (beys) who for generations had levied a heavy tribute on their labor and their harvests. The defeat of the Turkish armies meant something more than a political change. It reversed the relation of conqueror and serf; it promised a social revolution.

II. *Destructiveness of War Through Disease and Wounds.* Part II of the study is devoted to a discussion of the principal diseases from which soldiers suffer in time of war. Much interesting and instructive material has been collected from various sources and here presented on such diseases and affections as beri-beri; scurvy; cholera; plague; diarrhœa; kala azar; typhus; typhoid; polyneuritis; tetanus; dementia præcox; hysteria; venereal diseases; crippled feet and other pedal infirmities; frost-bite; vermin, called by Shipley "the minor horrors of war"; etc., etc.

In discussing the nature and variety of wounds received in battle, Dr. Jones quotes from Keefer.* It is presumed that:

*Keefer, Frank. A TEXT-BOOK OF MILITARY HYGIENE. Philadelphia, W. B. Saunders Co., 1914.

Of 100 men hit, there will be one dead to each four wounded; that:

20 will be killed

15 require transportation lying down

35 require transportation sitting up

5 will be too wounded for transportation

25 will be able to walk

The head and neck will be wounded in 16 per cent of cases

Trunk will be wounded in 30 per cent of cases

Upper extremities will be wounded in 26 per cent of cases

Lower extremities will be wounded in 28 per cent of cases

A very significant paragraph in this section of the study is headed: *Rôle of Diseases in War:—*

> Major Lelean* states that yellow fever carried off 50,000 out of 58,000 men in the San Domingo campaign of 1802; that in 1812 the Bavarian force mustered only 3,000 out of 28,000, owing to loss from typhus fever; that the Russians lost one-half of 120,000 men after Plevna from the same cause; that the allies lost 10,000 from cholera in the Crimean War; that in the last Balkan War the Turks lost daily from cholera, 500; that in 1828 the plague took 6,000 in one month from the Russian army; that dysentery caused 1,342 deaths and 38,000 cases of sickness in the South African War and in the same war England had 57,000 cases of enteric with 8,000 deaths; in the war of 1870-71 Germany had 73,000 enteric cases with 8,900 deaths; in the Spanish-American War 66 per cent of the typhoid cases could be traced to contact infection.

III. *Economic Results of War.* A chapter upon the subject of war finance and taxation. The author shows the enormous per capita cost of war, taking the Balkan Wars and our war with Spain as bases. There are also comparative tables of rates of taxation in the United Kingdom, France, Germany, and the United States.

IV. *The Civilian Population and War.*

Not only does the soldier at the front suffer hardship and privation, but the entire civilian population appears to suffer in proportion. Indeed, Dr. Jones concludes that the deaths due to overwork, starvation, deprivations and mental uncertainty among the women and children and those left at home closely approximate those among the soldiers.

Says Dr. Jones:—

> . . . . . Such facts as are available have warranted a positive conclusion as to the evil influence of war upon the morals and heredity of the nations. In our first table we have shown the losses due to some of the great wars. But these do not reveal the number of widows, of orphans, of cripples—an increased tax upon the state—nor of women capable of mating deprived of fitting mates. We have quoted at length from the Balkan report the facts which show the similar disgenic and unmoral effects of present wars. We have presented facts showing the spread of diseases due to occupation of territory by infected troops—diseases of such a nature that they impair the germ plasm itself, thus affecting the entire population. We have shown that such economic and social adjustments are forced upon the people that it is impossible during war times and for some time after their close to provide proper environment for the complete development of the capabilities of heredity. We have pointed out the various diseases which were already getting a foothold in new territories, largely European. Since writing that section, the

*Lelean, Major P. S. SANITATION IN WAR. London, J. and E. Churchill, 1915.

various nations of the Balkans have become more largely involved and with them will enter, more and more, the diseases mentioned. . . . . .

During war all agencies are occupied in its pursuit. Schools are often suspended (Balkan report p. 268), the curriculum interfered with, medical inspection of them given up (see Introduction), children occupied in war business, school plants even taken for hospital purposes, municipal sanitation, milk supply, etc., neglected. This affects adversely the babes and the mothers as well as the older children. There is no time to provide adequate open-air schools, forest schools, lunches, etc., even if there were means and people to operate them.

Again, referring to the morale among the soldiers, whether in times of war or in times of peace:—

The Balkan Commission has well said, "Widespread and almost universal maltreatment of women and girls by the soldiers of the three nations has left behind moral consequences which cannot be overestimated." And again, "It is to be feared that many a young man learned for the first time to commit acts of violence and crime not permitted in civilized warfare." We might add that, judging from the facts of the present war, there probably is no such thing as "civilized warfare".

Living, breathing, thinking, this atmosphere of hate, rapine, vengeance, there must follow a psychological reflex whose moral tone is conducive to the lowest standards—decidedly immoral.

No one has ever judged that the life of the soldier in time of peace is conducive to highest morals. Only where he has sufficient work to keep him busy is it possible for him to control the human passion. A large standing army, except in time of war, is necessarily idle much of the time. The result of this is the same whether in soldier or in civilian—a letting down of the inhibition necessary to the best interests of society. A community is inclined to suffer morally from the presence of idle troops no matter how fine a body of men these may have been in their private lives, outside of the army.

V. *The Elimination of the Most Fit.* The theme developed in section V is the fact that (1) the conditions and requirements of a good recruit and good soldier are the products of peace and are such as many of our businesses and occupations demand, and (2) from the very nature of warfare it is ever those who are selected as the fittest among the fit that inevitably fall in action or are grievously wounded and permanently disabled.

To quote:—

From those who claim that war takes away the best to those who claim that it provides for their survival is certainly a wide range. And the data are conspicuous by their absence. In view of the fact that we cannot have data as to the accomplishments of the non-survivors had they survived, our conclusions must be inferential at the best. If the canons of selection used in recruiting are fulfilled, it would seem self-evident that many of the best, judged by every eugenic standard known, do perish, do not survive, do not propagate their kind. Yet in spite of wars the population has increased, even in war-ridden countries.

It is difficult to believe that the taking of so many young men and those in the prime of life from their homes, as happened in our Civil War, affects the country favorably in promoting the survival of the fittest. Though it is impossible to measure the effect by any standard known it would seem that the destruction of a large part of the productive force of the land must deter progress, must at least result in a sort of plateau on which the nation rests until it has recuperated and gathered momentum.

We know of no sufficient data either to substantiate or refute this assertion. In fact, as suggested in our introduction, machinery for the gathering of data has been absent. . . . . .

> The wars of today are not the tribal affairs of yore. The latter did in a way eliminate the weaker, the cowardly. But the modern war, in which we have the volunteer, eliminates the virile, the strong. . . . . Thomson* rightly claims that environment is hardly comparable with war as a natural selective agency. As Dr. Sargent† has pointed out, struggle is a biological necessity, for the life of the body as a whole depends upon it. But war is not such a struggle and is not necessary unless the life of the nation is threatened by starvation, internal uprisings, or invasion of an avowed enemy.
>
> The aeroplane, submarine, machine guns, long range cannon, have changed the character of war. Now there is little opportunity for personal prowess. Burrowing, trenching, ditching, shooting from under cover have made engagements now stupid and dull. Naval battles are at long range. This, he states, tends to promote Asiatic fatalism. It is not fit material for the development of courage. This can be done better through proper exercise and athletics.

VI. *Benefits to the General Population* if (a) It should follow as efficiently as soldiers the training and care the latter have in hygiene; and (b) the efforts now expended upon soldiers alone were expended upon the general public.

These benefits would be almost beyond comprehension. If every citizen possessed the facilities for carrying out and was required to practice the more obvious requirements of hygiene, for example in such matters as bathing, care of the teeth, diet, fresh air, physical exercise and general medical attention, the world would be well-nigh rejuvenated in a remarkably short period of time.

> War serves to point out the particular hygienic and sanitary factors which reduce its horrors and make possible the successful accomplishment of its purposes. In this sense, it is a benefit to mankind, but at such a fearful cost that it would seem that calm, careful consideration of the same factors and daily observance of them would accomplish much more with less effort and expenditure.
>
> . . . . . Advocates of militarism have pointed to the great benefits to be derived from military training. The conditions under which this training is taken have warranted such a conclusion. It should be observed, however, that should civilians follow the same methods with the same degree of tenacity and spirit—as many do—the result would be even greater than is possible under the stress of war. For as we have already shown, the previous hygienic training of the general population of Germany and Great Britain has resulted in the acceptance of more applicants under most strenuous physical requirements and has lessened the amount of preliminary practice necessary to make efficient soldiers of active men whose lives have been spent in labor, business professions, etc. War serves but to *emphasize* the factors which should function at *all times*. It shows how costly the neglect of health may be, not only in war but in peace. The warrior of today of necessity must have been the citizen of yesterday. War serves to show forcibly the need of following simple laws of health, of obeying the seemingly trite rules of hygiene.
>
> . . . . . While these injunctions are particularly apropos for the nations at war, it certainly would seem that the opportunity for their most efficient functioning is in times of peace. The real preparedness for the struggle of life, whether it be war or peace, public or private, is made through the formation of correct habits of conduct during the plastic years. If instruction really functions, it would seem that the logical conclusion for pedagogy is that a large part of all our instruction should at all times be given under the same principle, namely, the actual training through action under conditions correlated with the home and civic environment of the child.

*Thomson, Prof. J. Arthur. Eugenics and War. Laucet, London, 1915, V. 1, p. 450.
†Sargent, Dr. Dudley. Am. Phys. Ed. Rev., Springfield, Mass., 1915, V. 20, No. 3.

A bibliography of 267 titles upon the general theme of war and disease is appended to the subject matter of the bulletin. Complete copies of the work may probably be obtained from the Endowment at its New York City address, at 407 West 117th Street.

PUBLICATIONS RECEIVED

PROBLEMS OF SUBNORMALITY, by J. E. Wallace Wallin, Director of the Psycho-Educational Clinic, Board of Education, St. Louis, etc., etc. With an introduction by John W. Withers, Ph. D., Superintendent of the Public Schools of St. Louis. Yonkers, N. Y., World Book Company, 1917. 485 pp.

Unquestionably this compendious volume represents the most exhaustive and thoroughly scientific treatment of the great question of subnormality that has thus far appeared. Dr. Wallin has for many years enjoyed unparalleled opportunities in the first-hand study of a great variety of types of mentally abnormal children not only in residential institutions but also in large public school systems, and he has had a wide experience in the training of teachers for normal and subnormal children and in the administration of public-school classes for subnormal children. Setting out with a brief historical outline of the attitude which society has assumed in the past toward its feeble-minded members, the author approaches the question as to who is feeble-minded. Dr. Wallin believes emphatically that the standards which have been most frequently used in this country during the last six years yield entirely too high a percentage of feeble-mindedness. There was a time when the estimates of the number of such persons in the general population, in the schools, courts, prisons, and reformatories was too conservative. But the pendulum has now swung to the opposite extreme. Feeble-mindedness has become the Nemesis of our times. We are now told that at least 3% of elementary-school children are feeble-minded, that at least half of the delinquents are feeble-minded—the figures given are sometimes nearer 100% than 50%—and that most of our social ills are due to feeble-mindedness. Dr. Wallin would not be interpreted as for a moment mimimizing the extreme importance of the problem, but he sees in feeble-mindedness only one of our social difficulties. He concludes that the number of feeble-minded children in the schools varies from less than one-half of 1% to less than 1%, instead of 3% or more, while the number of subnormals in the courts, reformatories, assignation houses and penal institutions varies from around 10% to 25%, instead of from 50% to 97%.

Dr. Wallin would, in order to develop a more sane perspective of the problem, not only more sharply define such terms as "defective children," "mental deficiency," "subnormality," "moronity," and "criminal imbecility," when applied to Binet-Simon X and over, but he would urge the need for more scientific training and wider experience on the part of the examiners. The blunders which will be made by an amateur

on feeble-mindedness are in his opinion similar to the blunders which will be made by an amateur on physical diseases, and he contends that many of the surveys of feeble-mindedness that have been made by amateurs are not only quite worthless as scientific documents, but have done much harm because of their extravagant claims to "scientific accuracy."

A large portion of the work is devoted to constructive discussions and recommendations concerning mentally and pedagogically retarded children, the problem of feeble-mindedness in its educational and social bearings, the problem of epilepsy in its psychological, educational, social and medical relations, state provisions for defective children, and the hygiene of eugenic generation.

SUGGESTIONS OF MODERN SCIENCE CONCERNING EDUCATION, by Herbert S. Jennings, John B. Watson, Adolf Meyer, all of Johns Hopkins University, and Walter I. Thomas, of the University of Chicago. N. Y., the Macmillan Company, 1917. 211 pp. $1.00.

A series of 4 lectures, prepared at the suggestion of "The Joint Committee on Education," although there is no clue in the foreword (nor elsewhere) as to just what "joint committee" is referred to. Notwithstanding this oversight on the part of the Chairman of the Committee (who signs his foreword with his initials, E. S. D.) the value of the essays is unmistakable. Professor Jennings' paper is entitled *The Biology of Children in Relation to Education.* Bearing in mind the constant analogy which the child organism bears to the plant organism, the writer leads us through a very interesting and readable discussion of heredity and diversity in children; of the three rules of development, which he states as (1) that of the gradual and spontaneous development of the powers, (2) that of the interdependence of the physical and the mental, and (3) that of "attention" in physiology and development; and finally of those safeguards which are indispensible in the growth of the child and of all other organisms, namely, protection from blights, nutrition, the external conditions and exercise of the powers. Professor Watson's contribution, *Practical and Theoretical Problems in Instincts and Habits,* represents the conclusions of the laboratory man. Dr. Watson is inclined to the belief that the fundamental emotional reactions can be grouped under three general divisions: (1) those connected with fear; (2) those connected with rage; and (3) those connected with joy or love. He refers to our past neglect of the study of emotions and makes some interesting suggestions for future work. In discussing the laws of habit formation, he presents four of the most important conclusions suggested by laboratory experimentation:

(1) The law of diminishing returns from practice.

(2) The less the number of habits formed simultaneously, the more rapid the rise of any given habit.

(3) The younger the animal the more rapidly will the habit be formed.

(4) The higher the incentive the more rapidly the formation.

Dr. Meyer's subject is *Mental and Moral Health in a Constructive School Program.* His treatment includes a discussion, among other suggestive topics, of the recent broadening of the field of psychiatry, the biological conception of man, language as a source of serious educational problems, the modern tests of a school system, studies in mental hygiene,

the psychological view of problems met in school, helps from medical experience, the need of studying the individual case, the problem of moral health, etc., etc.

In his section, *The Persistence of Primary-Group Norms in Present-Day Society and Their Influence in Our Education System*, Professor Thomas suggests that human behavior seems to represent four fundamental types of interests or wishes—those connected with the desire for new experience, those connected with the desire for mastery, those connected with the desire for recognition, and those connected with the desire for safety or security. The essay is an interesting attempt to relate these four fundamental types to the norms of primary groupings, or of "those societies which through kinship, isolation or voluntary adhesion to certain systems of definitions, secure an emotional unanimity among their members."

THE RURAL SCHOOL PLANT, by S. A. Challman, Commissioner of School Buildings for Minnesota. Milwaukee, The Bruce Publishing Company, 1917. 256 pp. Ill.

This book is by far the most complete work heretofore published on rural school architecture, construction and equipment. Notwithstanding the recent popularization of the consolidated school idea, Mr. Challman believes, and we think rightly, that with our democratic form of school government we cannot hope to eliminate the small rural school, at least until we can build up a more general appreciation of what a better plant can give us. In many instances this appreciation can best be secured by increasing the efficiency of the existing rural school plant. Timely and creasing the efficiency of the existing rural school plant. Timely and well-directed efforts to improve the rural school are sure to bring their rewards not only in increased opportunities to the children who attend, but also in an enlarged vision of the value of the public school to the community as a whole. In consequence of his theory, Mr. Challman has produced a very practical book for practical school boards. The most minute details of modern school building construction are entered into, and everything is gratifyingly up-to-date. The illustrations are numerous and well-selected. It appears to us that here is a manual of rural school architecture and sanitation that ought to be on the shelves of every rural school administrator in the country. This JOURNAL takes pleasure in recommending *The Rural School Plant* to any who may be seeking for the best and most recent in the construction, equipment and surroundings of the country school.

BOSTON HEALTH DEPARTMENT, *Monthly Bulletin*, Francis X. Mahoney, M. D., Commissioner. September, 1917. 20 pp.

THE PSYCHOPATHIC LABORATORY IN THE ADMINISTRATION OF JUSTICE, by Clinton P. McCord, M. D., Health Director of City Schools, Albany, N. Y. Reprinted from *The National Humane Review* for October, 1917. 8 pp.

A plea for the establishment of a psychopathic laboratory for the scientific observation and study of criminals and juvenile offenders. Dr. McCord discusses in some detail the four chief lines of work which these laboratories carry out in cities where they have been established, thus:—

(1) An investigation into the physical condition of the offender.

(2) An expert inquiry into the sanity of the accused.

(3) A careful study of his educational ability, family history, heredity, and environmental handicaps, together with a report on his industrial and social history.

(4) An expert analysis of the mentality and moral development of the accused.

Dr. McCord would have these laboratories available particularly "to the schools and the Juvenile Court where crime is seen in its kindergarten stage."

RURAL SCHOOL MODELS AND FARM MODELS, Educational Exhibition Company, Providence, R. I.

A folder showing four large cuts of a series of models being prepared for the West Virginia State Board of Health, through whose courtesy the manufacturers are enabled to make reproductions of them. They should prove suggestive and valuable to rural workers.

NOTES ON THE USE OF PIN MAPS AND CHARTS BY HEALTH OFFICERS, by Gardner T. Swarts, Jr., C. E., Member *American Public Health Association* and the *American Civic Association*. Providence, Educational Exhibition Company, 1917. 24 pp. Ill. Price 25c.

An interesting exposition of the possibilities of the pin map and graph in keeping statistical facts in graphic form.

PHYSIOLOGY IN OUR PUBLIC SCHOOLS, by Albert Leffingwell, M. D. Published by the *American Humane Education Society,* Boston. Date not given. 4 pp.

A criticism of the practice of illustrating elementary facts of physiology in the public schools by actual experimentation upon animals. Two reasons are advanced by Dr. Leffingwell in defense of his position: (1) the viewing of such operation by some children is too suggestive of imitation, and (2) everything needful or desirable to be imparted to the young may be clearly and adequately taught without ever once drawing near to the line of danger, or demanding the sacrifice of life.

NEW PHYSICAL EXAMINATION RECORD CARD, for the public schools of New York City. Prepared by C. Ward Crampton, M. D., Director of Physical Training, New York City Department of Education.

HYGIENE AS NATURE STUDY, by Prof. F. M. Gregg, Peru, Neb., State Normal School. Published by the author, 1917. 150 pp.

A series of inductive-deductive lessons in hygiene for Grades V, VI, VII and VIII of the elementary schools, announcement of which was made in our October number (q. v.).

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THE WAR AND THE CHILD

Discours* prononcé par M. le Pasteur Ch. Wagner à la Matinée Nationale du 19 Novembre 1916, au Grand Amphithéâtre de la Sorbonne

Translated By

LAWRENCE AUGUSTUS AVERILL
Editor of The American Journal of School Hygiene

TRANSLATOR'S NOTE: *La Guerre et l'Enfant*, by Charles Wagner, the noted French moralist and philosopher, is one of the very few essays which have thus far appeared upon the social status of the child in the war-swept countries of Europe. In the whole history of this paralyzing struggle, there is no state or condition of life that has suffered more than that of childhood, and it is probable that in no countries has this suffering been more acute than in France and Belgium. Thousands of children have perished in flight; other thousands from hunger and cold; thousands more have been either physically maimed or mentally unbalanced by the horrible experiences through which it has been their sad fate to pass. The chronicle of childhood and its bearing upon the great war has yet to be written, but when eventually it is compiled it will be found to make up one of the darkest and most repellent pages of world history, before which all previous accounts of infantile persecutions such as the slaughter of the children of Bethlehem or the massacreing of the children who sought to wrest the Holy Sepulchre from the hands of the infidels after the fourth crusade will pale into insignificance. In this essay, which is addressed to the French people in general, M. Wagner is but giving voice to a new consciousness which is beginning to dawn not only in France but throughout the whole Western world with respect to the supreme social importance of the child and childhood. His allusions to the force of heredity, to the sanctity of the family, to the social and economic conditions of the home as factors of no little importance in the development of the child, to the desirability of protecting and, if necessary, pensioning maternity, to the complete dependence of the destiny of decimated France upon the readiness with which the social mind reacts to the immediate relief, the present succor and the perennial protection of maternity and childhood, point unmistakably to the birth of a renewed interest in and solicitude for the future welfare of the child as a social and a national asset the importance of which is beyond all estimation. M. Wagner's address to his countrymen, though all too brief, stands as one of the finest contributions to the problem of child welfare and conservation to be found in any language. The translator has endeavored to retain the

*Selections from this address were printed in "THE SURVEY," under date of December 1, 1917, acknowledgements to which magazine are hereby made by the translator for permission to publish the complete oration.

naturally impassioned style of M. Wagner, without being slavishly literal in his rendering into English.

Ladies, Gentlemen and Fellow Citizens:—

In such times as these it is impossible to adress a French audience on any phase of the war without being stirred to the very depths of one's soul at all the suffering and privation through which this noble country is passing. In a French assembly in these glorious days one has the impression of being in the midst of a great, eager family, each member of which is enthused with a most lofty purpose—the carrying forward to victory of a common effort and a common ideal, the destiny of France. These national matinees are, as it were, gatherings in which the heart seeks strength for its own continued sustenance; gatherings where citizen knocks elbow with citizen; gatherings where we envisage the past with calm serenity and the future with many a yearning breath and prayer for the victory and triumph which please God it shall bring forth.

In the wake of all the fury of the struggle, there are two estates of life which are especially deserving of pity and of succor: one is the wretched condition of the aged—those lives whose fleeting afternoon and eventide have been the more hastened and enshadowed by the gloom and the terrors which have continually haunted them. But the other and inestimably more lamentable condition of life is the sad plight of the children, thousands of whom lie at this moment in premature graves. It may be that upon some future occasion I shall speak to you concerning the former; today let it be of the children.

Where is that man in whose soul the very mention of the word child does not call up visions of inestimable grace, of unfathomable innocence, of immeasurable destiny? I say of immeasurable destiny because the future of France is necessarily in the keeping of those who are at present young in years and untried in experience. Truly as a nation France has today many a problem, not a few of which appear at this time to be well nigh unresolvable; yet I deem it not extravagant to assert that her greatest immediate problem is centered about her children—greatest because most intimately bound up with her future; immediate because in the name of the future it must be presently attacked.

A few words as to the direct effect of the war upon the estate of childhood. Wherever we turn our gaze over the desolated countryside there open before us illimitable vistas of landscape filled with sadness and horror—of homes crumbled to dust beneath the withering shrapnel, save only perhaps occasional pillars already overgrown with the rambling ivy, in very truth as if the pitying vine were fain to obliterate all traces of the conflagration; of villages smouldering in ruin and infested with the poor dumb beasts that have been terrorized by the concussion of heavy artillery. Upon the peaceful serenity amid which our people dwelt in security and happiness but yesterday there has burst suddenly the brutal din of the invader. Barbarous faces appear at the windows; bold footsteps cross the threshold; lust and malice desecrate the fireside; blood spurts from the breast of the mother and the temples of the child pressed close to it. What but a few hours before was a paradise becomes now a dwelling place of horrors. The humblest cottage where yestere'en the porridge steamed appetizingly upon the table and the fire gleamed cheerily in the grate—a veritable palace of delights to the happy heart—becomes no

longer tenable when the grim monster of war begins to fasten its merciless fangs upon the land. And now comes the wild flight of whole villages along nocturnal highways, stumbling in the darkness, falling by the wayside, perishing in the shadows. They surge into the crowded stations, weeping mothers carrying a few pathetic remnants of clothing as the sole relics of their earthly possessions, and pressing frantically to their breasts or leading dumbly at their side that most precious of all treasures, the child. Wither go you, mothers of France? Ah! Whither indeed! Into the great unknown, the uncertain, the untried—often to be engulfed in the tortuous maelstrom; occasionally to find open arms and kindly charity and pity in the interior, for in rendering mercy does humanity most nobly redeem its sovereign duty toward itself embodied in that divine law which enjoins us to love one another. To our eternal pride and satisfaction be it said that never have our national sympathies been so responsive, never have we been so ready and willing and eager to give ourselves in a noble task as during these terrible yet sublime days. But alas! As was to be foreseen from the nature of the case, and in spite of our best efforts, the succor has not infrequently come too late, and the very earth of France teems with the sepulchres of children.

Oh, sacred spirit of France! Never may we forget those children whom the beast has rended—cut off in the dawn of life and now lying in their narrow graves! Never in the future when times are calmer and memories fainter may we come to think of this greatest enormity of all as merely one of the natural consequences of a most deadly war! No! No! This is not war! It is murder! Can one call that war merely which is waged against our women and our children? Is the libertine to style himself longer a soldier, or the incubus a chevalier? Nor will we forget you, poor orphaned children, who still live but to cower in fear like startled broods of chicks driven hither and yon by the force of a cruel storm! In the name of conscience and of humanity we will be your willing benefactors with a whole-hearted devotion born of sympathy for your fate and memory of that brutality that fashioned it.

Great, powerful ally, thou child of France! Thou art for thy father in uniform in the trenches an unfailing source of inspiration; by visions of thy face riding over the thunder of the battle, or hovering in the damp trenches before him, or shining through the terrible din of the projectiles, he is nerved for the fray. Over him in his fitful sleep thy watch is kept as by a guardian angel. And when he finds enclosed in his letters those unintelligible scrawls traced by tiny unguided hands, how mightily are his energy and his determination renewed within him! Inestimably more precious and inviolable in deed are those bits of paper, still sticky with kisses, than were those other scraps of paper in the form of treaties which the great deceivers who signed them did not hesitate to trample under their feet!

And in the home, about the deserted fireside, the child is an ever-present inspiration for the poor mother and the old folks who are themselves burdened down beneath grievous cares. Happy the child, for he comprehends nothing of it all; he lives as in another world where sweet hope and happiness reign. He runs up to us; he climbs on our knees to caress us—and behold: it is as though some one grander than all the visible world, some one who smiles down at us from beyond the stars, had indeed come to us to bring a message of compassion to our enshadowed homes and our poor hearts—a veritable oasis in a wide desert. Like the flowers which at

first tokens of springtime push their way out from beneath the lingering snow, these children revive in us the assurance that all is not ended: they are as it were harbingers of that which eternally rejuvenates. And so we smile gratefully into their faces even though it be night in our own hearts —dark, leaden night—and a kind of dull, gray brightness penetrates into the soul in mourning.

France today has no hope save that represented by and embodied in French childhood. Bound up irretrievably with its destiny is the whole future destiny of this noble land which, though now invaded, insulted, calumnied, shall surely rise from out its own ruins and once more mount upward. Our childhood is the guardian of that same nobility to which a friend of France alluded when he apostrophized her in these words:

—O! sang de Bayard, je te salue parmi tant d'ignominies!—In our confused national gropings after light and direction, we must inevitably seize upon the child as the beacon light pointing out to us the way of escape from this disconcerting recoil of civilization itself, for it can be only through him that we can build and secure the future. To the interests of child development, welfare and protection therefore every other interest and every other ambition must be subordinated. From this there springs a dual obligation—the one social, the other individual. Each is incumbent upon us not only as a sacred trust from the past but, and perhaps in a larger sense, as a duty which we owe to the future—to those who are yet unborn. No categorical imperative can be more positive, more compelling, more binding upon man and woman alike than is that which is rooted in the welfare of the child in this epoch of devolution.

To make brief mention first of the social duty. One often remarks the inconsistency of our French attitude which is always very favorable towards whatever concerns the individual child and which yet is so indifferent in matters pertaining to children as social beings, or as members of the group. We appear not yet to have reached that plane in our educational thinking where we can lay the foundations for a social consciousness, at least so far as childhood is concerned. In my old country, Alsace-Lorraine, I used often to observe that whenever a herd of swine was being driven from one field to another the peasant had always to exercise the greatest care not to cause one of the young litter to squeal, for if he did the whole group became immediately incensed, and he was in imminent danger of being set upon and roughly handled. Doubtless you grasp the parallel. Whenever childhood suffers in consequence of parental vice and depravity, or of some such scourge as alcoholism, or as the result of any other excess, we are not inclined to be deeply moved as a people. The Frenchman seems imbued with that spirit of indifference which, regardless of his own individual appreciation of good health, clean environment and pure living as such, suffers an almost utter disregard of those qualities as being essentials in the social evolution of the child. And so I say, when the child is endangered in consequence of some or of all of these social evils, let us beware lest we be more indifferent than was the herd of swine when harm threatened the litter.

Closely related to this duty of safeguarding the environment as a factor in the development of the child is the attitude which it is incumbent upon us to assume toward womanhood—toward her in whose keeping is entrusted the sacred torch of life. In protecting French motherhood we protect also French childhood. What sort of offspring are we to expect, for example, if during the period of pregnancy the mother has been over-

worked, poorly nourished and perchance ill-lodged? Our whole French society must be brought to feel a new interest in and a deeper and more active solicitude for the economic and social condition of woman; maternity itself must be more favorably conditioned. In every conceivable way we must strive to solidify and enhance our family life; we must see to it that whoever assumes the responsibility of rearing children shall not only occupy a more exalted place in the social mind, but also, if need be, shall be better recompensed by society in dollars and cents. A country in which those who fulfill this sacred duty lived under less favorable conditions than those who neglect it would be a country with a confused and overturned social consciousness.

Let us look for a moment at the personal obligation which as individuals we are under to childhood. Every Frenchman is the hereditary bearer of a title to nobility that is grander than any rank to be found in the old orders of heraldry or the ancient charters of state: I refer to our personal honor and integrity. The sacred torch we have received from our forbears it is incumbent upon us to transmit undimmed and in full vigor to those who shall come after us. Was it of no significance that our great Pasteur on the day of his jubilee should refer so gratefully to the memory and example of his childhood? This grand old man, no less well known perhaps for his family devotion than for his incursions into the realm of the natural sciences, exclaimed in speaking of his father and mother, those simple and unpretentious citizens of Jura:

—Je vous remercie de ce que vous avez été!

We owe all indeed to our forbears. The very spirit which animates us; which appears in our language and gleams in our foreheads; that temperament to be encountered only in the land of the "poilu"—and there met with everywhere from citizenry to gutter snipe—; that natural good will; that characteristic charitableness and toleration; that gallantry; that calmness in the very face of death—all these things are the heritage of whomsoever is a Frenchman, and what a noble heritage it is! This is the patrimony of the ages, and no Frenchman dare prostitute it in his own person. Montaigne was a keen moralist, yet he made a grievous error when he fathered this sentiment: "If I play the fool it is upon my own head and at my own peril." By no means! In this age when we are being brought slowly to an understanding and appreciation of the laws of heredity and what the consequences of a man's acts may be upon his family —and through it upon society itself—we are minded to contradict that pernicious philosophy which asserts or even implies that the profligate is the sole victim of his way of living. It is only rarely that one plays the fool save at the expense of the immediate society in which he moves, of the social edifice of which he is a unit, and which is thereby rendered less sound. No one would deny that of all our criminals the traitor to his country is the most contemptible; and yet that man who is incontinent, who has lost his own self-respect and forfeited that of the group—he is such a traitor, for he has deprived his country of an essential element which is of inestimable value to its continued integrity and well-being, namely its own honor as vested in and entrusted to the keeping of those individuals who make it up.

There are doubtless some in this assembly who recall having seen a certain picture in which the artist has portrayed a maiden in the act of sewing a button upon the coat of a youth. The task finished, she is repre-

sented as playfulling pulling upon the thread. Below the picture is the very suggestive title:

—A quoi tient l'amour?—

It is evident that *love holds by a thread.* Now when one reflects that as it were the whole destiny of men and of races hangs by a similar thread, he realizes the delicacy of the situation. The child is such a thread holding together and safeguarding the home and family life. As for me, if I were able at the eventide of my life to depart hence in the assurance that I had been one of those who had aided in restoring and fortifying the cult of the hearthstone and of true affection, I should fall asleep content that I had neither expended my strength nor my time in vain. My fellow-citizens, I can but tremble for the fate of our country which is inevitable unless that careless and indifferent attitude toward home life so characteristic of many of us is shortly reversed. Many a Frenchman who in all matters else is a most patriotic and whole-hearted citizen, and who perhaps reckons among his fondest memories his own childhood and early family ties, is building as it were upon the sand. Would that all the shed blood of France and all its thousands of fallen youth might cry out in a mute appeal to the honor, to the spirit of devotion, of sacrifice, and to the family integrity of us all. We owe it to our dead not only to multiply but to honor and conserve the seed of France.

I must shortly finish, but let me first allude to a very ancient prayer. It is a prayer now three thousand years old, and yet its beauty and inspiration are forever new. It is found in the same source whence come those mighty hymns that are chanted in the cathedrals and temples—the Psalms of David. The Psalmist sings:

O Lord our Lord, how excellent is thy name in all the earth! who hast set thy glory above the heavens.

Out of the mouths of babes and sucklings hast thou ordained strength because of thine enemies, thath thou mightest still the enemy and the avenger.

Thirty centuries ago some one recognized that one of the noblest wellsprings of humanity for right, justice and freedom was the child. Ages since, in the progress of civilization, man would have fallen by the wayside in his despair, his privation, his suffering, if he had not been constantly encouraged and inspired in his upward trend by the awakening and the unfolding of new life in the child—if the divine plan, in a word, had not reincarnated man from generation to generation in those fresh, blessed beings who have loved him so, and who were in themselves emblems of a hope as lofty and as omnipresent as the eternal stars above.

Has there ever been a time in our whole national history when there was more universal need of renewing our faith in life and its responsibilities than at the present moment? Surely not. If we represent the Saviour of the world as a little child we shall not be deceived, inasmuch as the great saviour, the great healer, the great consoler, the great resource after the struggle and the horror will indeed be the child. In the gentle words of the Son of Heaven therefore we can but repeat:

—Laissons venir les petits enfants,—

And what is our responsibility in the matter? It is to establish a society which shall be salutary for the child to develop in; to create a social *milieu* the atmosphere of which shall be at once vivyfying and invigorating for him to grow up in; to speak such words of wisdom that he may hear and heed; to so shape our lives that he may safely imitate us; to so embody in our own lives the ideals of justice and virtue at home and abroad that he may venerate and respect us; to be so imbued with the spirit of uprightness that he may emulate that deference for others, that breadth of sympathy, that forbearance before the law, which go to make up the great strength of a democracy. Then some day, when we balance our account, we shall be able to say:

—Nos pères, nous vous avons été fidèles; nos descendants, nous vous avons préparé les chemins!—

And as to how well we shall have served our country, both in its tradition and in its wider, nobler future, the child shall bear witness before all the world.

A PLEA FOR ORAL HYGIENE FOR SCHOOL CHILDREN*

BY I. H. GOLDBERGER, M. D.

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More than seventy-five per cent of the children in our schools have defective teeth. Ninety-five per cent would be nearer the truth if the mouths of these children received more than the ordinary routine inspection. Less than one-fourth ever reach the dentist's office. The responsibility of such a deplorable state of physical unfitness is shared, equally perhaps, by the parents, the school, the family physician and the dentist. Years ago, the mouth of the school child was to the average intelligent person an unknown and neglected quantity. From our present knowledge, it can be said with safety that the majority of parents have not advanced much.

There are parents who still believe that there is no need of dental care, irrespective of the child's age, until the occurance of toothhache, at which time extraction affords the quickest relief. School authorities permit children with carious teeth and deformed mouths to enter the struggle of life, physically handicapped, without a warning of the dangers that may befall as a result of dental neglect. We must not lose sight of the physician who overlooks the responsibility of bad teeth in relation to cardities, rheumatism, periostitis, arthrities, sinus infections, etc., etc. And last but not least, we have our dental friends who still advise parents not to have cavities in primary teeth filled, because they will fall out anyway.

It was through the efforts of Dr. Jessen at the International Congress of School Hygiene at Nuremberg, in 1904, that school dental clinics first

*Read by invitation before the Bronx County Dental Society, New York, October 16, 1917.

became known and subsequently popular. When we consider that it is only thirteen years since the importance of school dentistry was first realized, and only more recently since the establishment of the first American school dental clinics, it must be admitted that our dentists have failed to emphasize the importance of dental prophylaxis and care, particularly for school children. This is not said disparingly, because the writer earnestly believes that dentists have long recognized the importance of sound teeth in relation to good health, but that they have failed to impress themselves and others with their own importance in the community. The same Chinese custom of paying a physician while the patient enjoys good health, should apply to the dentists as well. He should treat educationally rather than surgically.

The dentist's work should not begin or end with the actual examination and treatment of the teeth. Much can be accomplished through educational methods. To accomplish the best results, the dentist must have the co-operation of all individuals in charge of the rearing, of the education, and of the health of the child, namely, the parents, the school and the family physician.

Prenatal and Parental Care

Before parents can intelligently care for the child's teeth, they must be educated to look after their own health. Often this is difficult, but once the intelligent parent realizes the importance of the care of his own teeth, he will afford his children such professional care as needs demand. When a perspective mother informs her dentist of her maternal state, does it ever strike him that that is the time to begin treating the mother's teeth, and those of her offspring-to-be? Pregnant women usually have trouble with their teeth. They crumble easily. This is caused by a withdrawal of the bone forming substances from the mother's body to the child. The dentist would be overstepping the bounds, if he asked his patient if she has had her urine examined, or if she has had her blood pressure taken. But he should interest himself in the nature of her diet, for fear that a deficient intake of mineral salts, necessary for the structural development of the fetus, will cause her own teeth and bones to soften and crumble. This preventive treatment is most important, and no dentist should take it for granted that the obstetrician will assume the responsibility of looking after the mother's teeth as well as the rest of her body. It has been intimated previously that the dentist has underestimated his importance. Let him remember that he is one of the spokes in the wheel of health. Prenatal care is as much his business as it is the doctor's. Both have their fields and their usefulness. But the mouth and all that goes to make a good, clean healthy mouth, whether it is diet, constitutional diseases or a particular method of brushing the teeth, is the dentist's concern, and he should never lose sight of it. I never am consulted by an expectant mother, but that I immediately refer her to her dentist for advice in oral hygiene. Why shouldn't this educational hygiene come from the dentist? The dentist is the mouth specialist, just as the eye man is the eye specialist, the ear man, the ear specialist, and so on. Let each respect the other man's specialty.

Should the mother nurse her infant, there continues to be a drain on her bony system which includes the teeth, provided there is not a sufficient amount of mineral salts in the mother's diet to supply the child's

needs. Therefore our dental friends should continue to advise well balanced diets even after the child is born.

Beginning with the latter half of the first year, the baby should have solid food stuffs to chew. Plenty of orange juice given as early as the first month will minimize the tendency to rickets and scurvy. The fear that solid food will upset the child is often a cause for feeding soft, mushy, devitalized food stuffs, yet it is important to the development of strong healthy teeth, that they shall have exercise in biting and in chewing. Unless otherwise contra-indicated, I advise, as soon as the teeth erupt, the feeding of hard crusts of bread, zweiback, whole wheat and bran crackers. Vigorous chewing of foods that require thorough grinding to prepare them for digestion, keep the teeth polished and minimizes the formation of tartar deposits. Placques cannot easily maintain their hold on the teeth, if the teeth are used in grinding hard foodstuffs.

Since the health of the permanent teeth depend upon the care given the primary teeth, initial instruction in oral hygiene should be begun immediately after the child is born. To prevent early mouth infections, mothers should be cautioned against the cleaning of an infant's mouth by means of the finger and boric acid wipe. The family dentist should encourage the use of a toothbrush by the mother, as soon as the teeth appear, and she should see that the child knows how to use the toothbrush as early as the fourteenth month. One child in particular, with whom I am most intimately acquainted, practised the toothbrush drill every morning and evening at the age of fifteen months. At sixteen months, this little girl paid her first visit to the dentist, for two reasons, one to teach her that the dentist was her friend, and secondly, to have her teeth inspected, and to receive further instruction as to their care. On that occasion, the wise dentist advised the mother to return with the child in six months for a surface cleaning. This is an excellent educational procedure. Parents should be notified every six months, that their children's teeth need attention. If they don't respond, telephone them. If they don't answer, send your nurse. And if you are not successful with all that, turn your efforts elsewhere. In keeping up this clean mouth, healthy body campaign, the dentist will help to put oral hygiene on the map. During the "Toothbrush Week" held in St. Paul, Minn., a year or so ago, the business men of that city identified themselves with the campaign as a matter of business economy. As an example of the new interest displayed by corporations in their employees, the Colorado Fuel and Iron Company recently made an arrangement to furnish toothbrushes to children of their employees. Slowly but surely the business men of this country are beginning to realize that the most important business before them today is the business of the public health.

As the child grows older, parents should continue to receive instruction in oral hygiene, from one best equipped to give this information, namely, the family dentist. County Dental Societies should co-operate with Boards of Education, in all matters pertaining to oral hygiene and public health. A few years ago the Bronx County Dental Society and the First and Second District Dental Societies, assisted the New York City Department of Education in conducting the first and the most successful Dental Hygiene Week, this country has ever known. Dental literature of the most valuable kind was prepared by eminent dentists of these societies, for distribution to teachers, to parents, and to children. The "Toothbrush Drill" as advised by the Second District Dental Society, and ap-

proved by other leading dental societies, appears in the official Syllabus and Course of Study in Hygiene for Elementary Schools in the City of New York. The Division of Educational Hygiene of the Department of Education has recently published a pamphlet, "How To Safeguard the Health of the Child." This pamphlet, printed in English, Yiddish, and Italian, and distributed to parents of children entering school for the first time, contains a paragraph on the care of the teeth, as follows:

> "A child should be taught to clean his teeth before breakfast and before going to bed. Use a good clean toothbrush with tooth powder and water. Scrub the gums, especially, and clean the roof of the mouth and the tongue.
>
> A clean mouth makes a sweet breath and white teeth add to personal appearance. An unclean mouth makes a foul breath and causes the teeth to decay.
>
> Decayed teeth hold germs which cause more uncleanliness and decay.
>
> Contagious diseases, diseased tonsils, enlarged glands of the neck, rheumatism and heart trouble are often caused by the germs which grow in the cavities of decayed teeth.
>
> Proper chewing is impossible when the teeth are decayed and indigestion and loss of appetite follow.
>
> Second teeth decay early if the first are neglected. The *"six-year molars"* are second teeth. Save them!
>
> Toothache, sore and bleeding gums and gum boils occur frequently in children who have decayed teeth and unclean mouths.
>
> A dentist should examine the child's mouth at the beginning of each school term.
>
> > The small cavity should be filled before it has a chance to grow into a large one.
> >
> > The large cavity should be filled before the whole tooth is lost.
> >
> > The gums should be kept in good condition so that the teeth will not loosen and fall out.
> >
> > Artificial teeth should be avoided in the mouths of young people."

Dental literature, similar in nature should be issued for the enlightenment of parents, periodically, by the central committee on public health of the county dental societies.

School Care

The school system may assist in oral hygiene education in two ways: 1. Instruction and practise in the essentials of mouth hygiene. 2. The establishment and management of school dental clinics for prophylactic and curative treatment. The object of such combined efforts is to inculcate habits of cleanliness and care of the body, particularly the mouth, and to maintain and to promote good health and vigor. Health Days and Weeks are excellent to arouse public attention toward reform. But one Dental Hygiene Week does not make clean mouths and sound teeth any more than a swallow makes a summer. In other words, it is the mouth

hygiene habit more than a dental hygiene campaign lasting a day or a week, that counts for permanent cleanliness, good health and future happiness. The emphasis in class room instruction in oral hygiene should be placed upon the practical affairs of daily life such as methods and times of brushing the teeth, the selection of a toothbrush, tooth paste or powder, the care of the toothbrush, etc., and not upon theoretical instruction in anatomy and physiology. Such instruction should begin in the kindergarten grades and continue in more advanced form, each year, until the child graduates. Each topic should be related to daily practice (daily routine). Stories and actual illustrations from daily life, many of which may be supplied by the children themselves, should characterize the method of teaching dental hygiene in the child's early years. As the child grows older, he should be required to use textbooks, but the method of applying instruction to daily practice should be continued. The result of instruction should be tested by inspection of the teeth and mouth, and by questioning the pupils as to their success in putting into actual practice the teaching of mouth hygiene.

The following paragraphs taken from the Course of Study and Syllabus in Hygiene for the New York City Public Schools, illustrate the nature of the material used in driving home the subject of dental hygiene. Each child is required at the beginning of his school career to copy for home use an outline of a Daily Routine, which includes the morning and night operation of a Toothbrush Drill, the following being a typical example.

TOOTH BRUSH DRILL†

(For the Classroom)

A class leader, provided with a toothbrush, dentrifice, cup, water and a basin, should demonstrate this drill before the class. Every member of the class should follow the leader in pantomime.

Attention! (All in line, elbows close to side, with brushes in right hand and cups in left.)

1. *Ready—Dip!*
2. *Outside Surfaces.* (Brush inserted under cheek, teeth closed. Brush gums as well as teeth.)

Left Side—Ready—Count 1 to 16. Dip.
Right Side—Ready—Count 1 to 16. Dip.
Front Side—Ready—Count 1 to 16. Dip.

3. *Inside Surfaces.* (Mouth wide open, straight motion front to back.)

Upper Left Side—Ready—Count 1 to 16. Dip.
Right Side—Ready—Count 1 to 16. Dip.
Front Side—Ready—Count 1 to 16. Dip.
Lower Left Side—Ready—Count 1 to 16. Dip.
Right Side—Ready—Count 1 to 16. Dip.
Front Side—Ready—Count 1 to 16. Dip.

4. *Chewing Surfaces.* (Scrubbing vigorously.)

Upper Left Side—Ready—Count 1 to 16. Dip.
Right Side—Ready—Count 1 to 16. Dip.

†After the form advised by the Second District Dental Society.

Lower Left Side—Ready—Count 1 to 16. Dip.
Right Side—Ready—Count 1 to 16. Dip.

5. Empty cups and refill them—Ready—Count 1 to 16.
6. Rinse mouth.
7. Rinse brush.
(Shaking off excess of water over basin.)

N. B. Counting by leader should be rather brisk but even and should allow plenty of time for dipping and shaking of the brushes.

Materials.

1. Toothbrush (brought to school in envelopes made by leader).
2. Dentifrice.
3. Individual cup (paper preferably), made by the leader at home, to be half filled with water.
4. One pitcher of water
5. One tin basin.

Oral Hygiene Material from Syllabus on Hygiene.

Grade 1A.

3d and 4th week. *The Daily Routine.* Use of toothbrush, water, tooth-powder, dental floss; times of use. Neglect of first teeth and early decay of second. The toothbrush drill shown and practiced in pantomime.
13th and 14th week. *Cleanliness of the Mouth.* Cleaning mouth as well as teeth. Proper use of toothbrush. Cleanliness of mouth and decayed teeth.
15th and 16th week. *Decayed Teeth,* and improper chewing. Sound teeth and good chewing. Importance of eating slowly. Regular visits to dentist. Six-year molars are second teeth. Importance of saving them.

Grade 1B.

9th and 10th week. *Teeth.* Cleanliness of teeth. Individual tooth-brushes; their care. Cleaning mouth as well as teeth. Decayed teeth and unclean mouths. Use of toothbrushes, tooth powder, dental floss, times of use. Toothbrush drill shown and practiced in pantomime. Surface cleaning. Frequent visits to dentist.

Grade 2A.

1st and 2nd week. *The Daily Morning Hygiene Inspection* and simple reasons for the same as illustrations of personal hygiene. Particular attention to teeth. Sound teeth and good mastication. How to keep the teeth sound.
3rd and 4th weeks. *The Daily Routine.* Individual toothbrushes. Use of toothbrush, water, tooth powder, dental floss; times of use. Toothbrush drill shown and practiced in pantomime. Regular visits to dentist. Necessity of sound teeth and good chewing. Decayed teeth and insufficient mastication.

GRADE 2B.

1st and 2nd week. *The Daily Morning Hygienic Inspection* and simple reasons for the same. Cleanliness, sound teeth, good mastication, good digestion and growth of strong, sound teeth. Decayed first teeth infect second teeth.

3rd and 4th week. *The Daily Routine.* Individual toothbrush. Use of toothbrush, water, tooth powder, dental floss; times of use. The toothbrush drill reviewed and practiced in pantomime. Regular visits to dentist. Eating slowly; thorough mastication and good digestion.

5th and 6th week. *Teeth.* Enamel: protective covering; hardest substance in body; importance of its inegrity. Danger of breaking enamel from hard candy, nuts. Decayed teeth, putrifying food deposits, bacterial growth causing illness. Six-year molars are permanent teeth—save them! Regular visits to dentist. Filling of small cavity painless. Neglect means pain and loss of teeth. Improper chewing; bad digestion.

GRADE 5A.

7th and 8th week. Relation of clean mouth, good teeth and thorough chewing to good digestion, regular bowel movements and good health.

GRADE 6A.

1st and 2nd week. *The Items of the Daily Morning Hygienic Inspection* as illustrations of personal hygiene. Unsound teeth as avenues of entrance for disease germs. Special attention to cleanliness of teeth. Pins and picking teeth; avoidance. Good digestion: sound teeth, thorough chewing; regularity in eating.

3rd and 4th week. *The Items of Daily Routine.* Morning and evening use of individual toothbrush, water, powder and dental floss; their sanitary care.

7th and 8th week. The importance of a sound set of teeth; of masticating thoroughly.

10th and 11th week. *Emergency Measures.* Toothache, its prevention. Daily care of teeth and semi-annual visits to dentist. Use of proper foods to harden enamel.

SPECIAL COURSE

HYGIENE FOR THE WORKER

FOR CLASSES OF CHILDREN PREPARING IMMEDIATELY FOR WORK

1st and 2nd week. *Teeth.* Proper care. Toothbrush drill. Causes of dental decay. Prevention of dental decay. Good teeth and attractive appearance. Good health, attractive appearance, and fitness for work.

SCHOOL DENTAL CLINICS

The time is not far off when dental clinics will be connected with every public school. These school dental clinics should be maintained by the

student and parent organizations, for the purpose of prophylactic and corrective work. Children should be made to visit the clinics as part of their practical instruction in hygiene. Just as time and place are set aside for the inspection and examination of physical defects by the school medical inspector, so should ample opportunity be given for the examination and treatment of mouth defects by school dentists.

School medical inspectors report that 75% of school children have carious teeth. An examination of these same children by dentists would disclose that 95% have dental caries. The medical inspector can detect the obvious cavities, but misses the very small ones. The time to repair teeth is when the break in the enamel first begins, and not when the tooth is so badly decayed that the child's grandmother would consent to treatment. Dentists should resent the examination of a child's mouth by a physician, just as strenuously and as emphatically as the physician would object to an examination by a dentist for adenoid tissue, because this growth when present may dwarf and narrow the upper jaw, causing malocclusion of the teeth, improper chewing, and imperfect digestion. As has been stated, the majority of those presenting themselves for dental treatment, suffer from toothache. This is often the danger signal that the time to save the tooth is gone. School dental clinics could make toothaches unknown. Dr. Mary Gallup, of Boston, reports that an examination of the mouths of 3,000 adult Americans, disclosed the rather astonishing fact that only seven had complete sets of six-year molars. When we consider that these and other teeth are often mistaken by parents for temporary teeth, and that their decay and loss frequently undermine the health of the child for life, it is not difficult to understand why we should not "take the bull by the horns," and prevent much unnecessary ill health, through prophylactic dental hygiene in public school clinics. If given regularly and systematically, dental hygiene instruction in the class and in the clinic would lead to the formation of good dental habits. The beneficial results would do much to relieve the "I'm from Missouri" attitude most parents take in our efforts to improve their children's health and school progress.

There are entirely too few dental clinics. The responsibility of the lack of school dental clinics may be placed on our public officials, but the finger of blame of the lack of dental clinics for school children outside of school buildings, points to the individual dentist. The number of children dental clinics in and out of school buildings of New York City, can be counted on the fingers of both hands. The number of children's medical clinics in this city, could not be counted on all the fingers and toes of those present here tonight. There is as much necessity for the children's dental clinics as there is for the children's medical clinics. Both should co-operate for the child's benefit. I hate to think of the suffering of thousands of sick children, and of the misery of their parents, if this city had as few pediatric clinics as it claims dental clinics.

I dislike to feel that the dentist has shirked his duty. I dislike to feel that the dentist is unwilling to stray away from his office an hour or two, three times a week, to work side by side with pediatricts in hospitals, clinics, and dispensaries. To popularize the need and the importance of oral hygiene, dental men will have to follow in the footsteps of their medical brethren.

There should be a full attending dental staff, and a regular dental service connected with every institution in this city caring for the sick.

This is an innovation every county dental society owes its members and the community. The dental profession has acted admirably in volunteering its service gratis to our army recruits. But it took a world's war to take them out of their regular office practice and routine. Please don't wait until the children declare war—prepare them for a life of peace and happiness by doing your bit now.

Announcement for 1918

Beginning with the first number of the new year, THE AMERICAN JOURNAL OF SCHOOL HYGIENE *will reënter the ranks of educational journalism as a quarterly publication of the first class. We are convinced that we can better serve our increasing number of readers and at the same time do fuller justice to the great field which we represent by reducing our yearly issues from ten to four and by making those four the most scholarly as well as complete chronicles of thought and practice that the field of educational hygiene can afford. A corps of experts will continue on the staff of associate editors and the size of the* JOURNAL *will be substantially increased. Our ideal for 1918 is to enter every higher institution of learning and every department of hygiene in this country. True ideals are never attained, but they are often approximated. Can you aid us?*

The rate for 1918 will be increased to $2.00, payable in advance.

THE AMERICAN JOURNAL OF SCHOOL HYGIENE

Lawrence Augustus Averill, *Editor*
Worcester, Massachusetts

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